

AGE, SEX, AND SIZE COMPOSITION OF PACIFIC HERRING  
FROM COASTAL SPAWNING SITES IN THE  
ARCTIC-YUKON-KUSKOKWIM REGION, 2002



By

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Regional Information Report No. Report<sup>1</sup> No. 3A03-03  
Alaska Department of Fish and Game  
Commercial Fisheries Division  
Arctic-Yukon-Kuskokwim Region  
333 Raspberry Road, Anchorage, Alaska 99518

February 2003

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## ACKNOWLEDGMENTS

The author would like to express appreciation to the ADF&G technicians, fishery biologists and commercial fishermen for collecting the 2002 herring biological data. Credit is also due to Gary Kneufer, Shawna Karpovich and Paul Salomone who aged the scales for the region. Susan McNeil provided draft review of this report.

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## ABSTRACT

Pacific herring (*Clupea pallasi*) were sampled from seven of the eight commercial fishing districts within the Arctic-Yukon-Kuskokwim (AYK) Region of the Bering Sea, during their 2002 spring spawning migration. The total biomass in all AYK districts combined was 55,988 tons and the harvest was 2,540 tons. Between 6 May and 9 June, 12,461 herring were sampled for age, sex, and size information. Samples were collected from variable-mesh gillnets fished by Alaska Department of Fish and Game personnel, and from commercial gillnet, purse seine and subsistence harvests. Throughout the region, age-5 and age-6 herring were the most abundant age classes. The percentage of recruit herring (ages 2 through 5) in all AYK districts combined comprised 47.4% of the return in numbers of fish, the second highest recruitment percentage since 1982. Males were more abundant than females in variable-mesh gillnet samples while females dominated in commercial harvest samples.

KEY WORDS: *Clupea pallasi*, Bering Sea, biomass, commercial fishing district, commercial harvest, variable-mesh gillnet, age class, recruit herring

## INTRODUCTION

The age, sex, and size composition data, collected from Pacific herring (*Clupea pallasi*) in the Arctic-Yukon-Kuskokwim (AYK) Region of the Bering Sea are used to assess stock status, gain knowledge of population dynamics, formulate management plans, and facilitate inseason management decisions. The Alaska Department of Fish and Game (ADF&G) has conducted similar studies annually since 1976 (e.g., McBride et al. 1981, DuBois 2002).

The study area comprises the coastal waters of Alaska from Cape Newenham to Cape Prince of Wales (Figure 1). Eight regulatory commercial fishing districts are located within the AYK Region: Security Cove, Goodnews Bay, Cape Avinof, Nelson Island, and Nunivak Island Districts are located within the Kuskokwim Area, whereas Cape Romanzof, Norton Sound, and Port Clarence Districts are located within the Bering Sea-Kotzebue Area. Norton Sound is further divided into seven subdistricts (Figure 2). AYK herring districts are identified and described in the commercial herring, fishing regulations (ADF&G 2000).

The timing of the spawning migration of herring in the northeastern Bering Sea is greatly influenced by climate and ocean conditions, particularly the extent and distribution of the Bering Sea ice pack. Most herring appear soon after ice breakup, which generally occurs between late-April and mid-June. Spawning usually begins in the Security Cove District and progresses in a northerly direction. In some areas, spawning may continue as late as July.

## METHODS

### *Sampling Techniques*

Variable-mesh gillnets<sup>1</sup> (VMG), consisting of 1.5, 2.0, 2.5, and 3.0 inch stretch-mesh panels, designed to sample age classes in proportion to their abundance, were used by ADF&G personnel to sample the population. Commercial gillnets are the only legal gear in most of the AYK Region, with the exception of Norton Sound where a portion of the harvest is normally taken using beach seine gear and Nunivak Island where a cooperative purse seine fishery is allowed. In 2002, gillnets were fished in all districts except Nunivak Island where purse seine gear was fished. In the Kuskokwim herring districts, commercial samples were collected from gillnets with mesh sizes ranging from 2 3/4 to 3 1/4 inch. Samples were also collected from subsistence gillnet harvests in the Nelson Island District (2 inch mesh) and the purse seine fishery in the Nunivak Island District.

<sup>1</sup> The floating variable-mesh gillnet (VMG) is 100 ft (31 m) in length and 10 ft (3 m) in depth and consists of four 25 ft (8 m) panels with stretch mesh sizes of 1.5, 2.0, 2.5, and 3.0 inches (38, 51, 64, and 76 mm).

In the Cape Romanzof and Norton Sound Districts, commercial samples were collected from gillnets with mesh sizes ranging from 3 to 3 1/4 inch.

Data collection methods were similar to those described by Barton and Steinhoff (1980). Length, weight, sex, gonad weight, gonad maturity index and scales were obtained from herring sampled from each gear type. Fish were measured to the nearest millimeter, weighed to the nearest gram, and aged by counting scale annuli viewed with a microfiche reader. Sample size goals were based on the methods of Thompson (1987). The sample size goal was 420 herring from each commercial gear type in each district or subdistrict per week. The sample goal for VMG catches was 60 fish per day. VMGs were fished for short durations to avoid saturating any single mesh size with fish. An effort was made to sample fish from several schools each day to promote representative sampling of the run. VMG sample data is summarized by seven-day periods, which are consistent from year to year.

Miscommunication with sampling crews caused some data collection methods in the Kuskokwim districts to differ from the usual methods. Lengths in the Security Cove and Goodnews Bay Districts were measured by fork length (nose-to-fork) instead of the usual standard length (nose-to-hypural plate). After this discrepancy was recognized, samples were measured by both fork and standard length. Analysis comparing the two length types was done to estimate standard length from fork length ( $y=0.924x-2.464$ ,  $R^2=0.964$ ). Known fork lengths were then converted to standard lengths. Other differences in data collection were lengths recorded to the nearest 5 millimeter and individual weights were not taken from the commercial harvest samples.

### *Estimation of Biomass Age Composition*

Aerial surveys have been the primary method of assessing herring biomass, timing and spawn distribution in the Bering Sea herring fisheries since 1978. Aerial survey procedures followed those outlined by Lebida and Whitmore (1985). Biomass estimates from aerial surveys in the AYK Region are often difficult because of unfavorable weather, ice conditions or turbid water. In these cases, preseason projections, spawn deposition observations and commercial and VMG catch rates may be used to estimate the biomass in districts where poor aerial survey conditions precluded an accurate assessment.

The method used to estimate the age composition of the run biomass and escapement biomass differed between districts. For the Security Cove, Goodnews Bay, Cape Avinof and Nunivak Island Districts, the age composition of the run biomass was estimated from VMG catches. The age composition of the escapement biomass was estimated by subtracting the harvest from the run biomass for each age class. For the Nelson Island, Cape Romanzof and Norton Sound Districts, the age composition of the escapement biomass was estimated from VMG catches. The age composition of the run biomass was estimated by combining harvests with escapement biomass for each age class. For all districts, the age composition of the harvest biomass is usually estimated from commercial harvest sampling. For each district, the number of herring in the run, harvest, and

escapement was converted from tons using age-specific average weights of fish sampled from VMG and commercial catches. To calculate the number of herring harvested in the Kuskokwim districts, weight-at-age from VMG samples were substituted for commercial harvest weight-at-age because samples were not taken from the Kuskokwim commercial harvest. More detailed information on the methods for estimating the age composition of the biomass is presented in Hamner and Bromaghin (1999). Because VMG sampling was not conducted in the Nunivak Island District, Nelson Island VMG data were used to estimate that age composition. Security Cove age composition summaries were compiled using combined VMG samples from Security Cove and Goodnews Bay. The samples from these districts were combined because most of the Security Cove samples were collected after the commercial fishery, and using only the Security Cove samples may overestimate the younger age classes.

## RESULTS AND DISCUSSION

ADF&G personnel sampled 12,461 herring between 6 May and 9 June from VMG, commercial gillnet, commercial purse seine and subsistence gillnet harvests. Samples were taken from the Security Cove, Goodnews Bay, Cape Avinof, Nelson Island, Nunivak Island, Cape Romanzof, and Norton Sound (St. Michael, Unalakleet, and Cape Denbigh Subdistricts) commercial fishing districts. The age, sex, and size data, collected from sampled herring, are summarized in Appendices A.1-19. Age composition data were not collected from the Port Clarence District in 2002.

Samples were collected from age-2 to age-17 herring in the AYK Region. Unreadable scales composed 12.8% of all scale samples (Appendices A.1-19). The percentage of unreadable scales, unaged herring, ranged from 2.1% in the Cape Denbigh Subdistrict to 19.4 % in the Cape Romanzof District. Readability of herring scales is dependent on the area of the body from which the scales have been removed, regeneration caused by a combination of injury and scale loss, the sampler's ability to collect a readable scale and the ability of the person reading the scales. The proportion of unreadable scales is expected to increase for older-aged herring because scale loss increases and the presence of multiple closely spaced annuli make aging more difficult. The relatively high percentage of unreadable scales in 2002 is primarily caused by a high percentage of unaged herring in the commercial harvest. For example, the percentage of unaged herring in the commercial harvest was 20.6% while in the VMG it was 10.4%.

In most districts, the mean length and weight from aged herring was less than the mean length and weight from unaged herring (Appendices A.1-19). For example, the Cape Romanzof mean length from aged herring was 269 mm and the mean length from unaged herring was 284 mm (t-test  $p=0.000$ ,  $df=2,140$ ). A similar comparison by mean weight was 289 g from aged herring and 335 g from unaged herring (t-test  $p=0.000$ ,  $df=2,128$ ). This discrepancy between aged and unaged mean weight and length suggests the relative proportion of unaged older herring may be greater than

unaged younger herring, and the age composition contributions from older herring may be underestimated.

The herring biomass for the region was assessed to be 55,988 tons in 2002 (Table 1). The herring biomass was distributed among the districts as follows: 8.5% in Security Cove, 9.9% in Goodnews Bay, 6.2% in Cape Avinof, 10.9% in Nelson Island, 9.7% in Nunivak Island, 6.4% in Cape Romanzof, and 48.3% in Norton Sound (Figure 3).

The commercial harvest, taken with gillnets and purse seine was 2,540 tons (Table 1). The herring harvest was distributed among the districts as follows: 3.9% in Security Cove, 0.5% in Goodnews Bay, 3.1% in Cape Avinof, 37.4% in Nelson Island, 6.9% in Nunivak Island, 3.9% in Cape Romanzof, and 44.2% in Norton Sound (Figure 3).

For most districts, the large recruitment (*ages* 2 to 5) that was observed in 1981 and 1982 was followed by nine years of reduced recruitment (Figures 4 and 5). In 1992 and 1993, a substantial recruitment of herring was again observed in most districts. In 1997 and 1998, increased recruitment from the 1993 brood year was observed as *age-4* herring in 1997 and *age-5* herring in 1998. In 1999, the AYK Region had a record low recruitment of 8.9% (Figure 6). In 2000 and 2001, all districts had increasing numbers of recruits and 2001 was the highest recruitment since 1982.

The total AYK herring recruitment in 2002 was the highest number of recruits since 1993 (Figure 5) and the percentage of recruits was slightly below that observed in 2001 (Figure 6). The AYK average recruitment of 47.4% was well above the 5-year average (1997-2001) recruitment of 29.8%. Recruitment ranged from 41.9% in the Cape Romanzof District to 68.9% in the Cape Avinof District (Figure 7). The typically higher percentage of recruit herring returning to the Cape Avinof District has been referenced in earlier reports (DuBois 2002). Recruits returning from the 1997 year class (*age-5*) comprised 43.7% of the total AYK herring population (Table 2, Figure 8). The returns from the 1996 and 1997 brood years account for the increased recruitment observed from 2000 through 2002 (Figures 4, 5 and 6). For example, *age-4* herring were abundant in 2000 and 2001, and *age-5* herring were abundant in 2001 and 2002.

*Age-5* herring dominated the biomass in all districts (range: 28.0%-53.8%, Table 1, Figures 9 and 10). *Age-6* herring was the second largest component of the biomass in all districts (range: 16.6%-26.1%). The third most abundant age class by weight was *age 9* (range: 6.3%-20.1%).

The age classes that dominated in numbers of fish were identical to those that dominated by weight. In numbers of fish, *age-5*, -6, and -9 herring were the first, second and third most abundant age classes in all districts (Table 2, Figure 8).

The relative abundance of *age-9* and older herring by weight was lower in the Cape Avinof (14.1%) district than in the other AYK districts (range 27.9% - 43.8%, Table 1, Figures 9 and 10). *Age-9* and *age-11* herring were the most abundant older age classes (12.3% and 7.3%, Table 1, respectively). The average age among all herring districts was 6.5 years. Cape Avinof had the youngest average age (5.6 years) while Cape Romanzof had the oldest average age (7.0 years).

In the AYK Region, age-9 and older herring comprised 83.4% of the commercial harvest, whereas recruit herring accounted for 3.6% (Table 1, Figures 9 and 10). The percentage of age-9 and older herring among fishing districts ranged from 23.5% in the Nunivak Island District to 97.8% in the Cape Romanzof District. The older age composition in the Cape Romanzof harvest is due in part to a record high percentage of age-14 herring returning (17.5%, Appendix A.7). Herring from the 1988 brood year, returning as age-14 in 2002, has consistently been reported in relative high abundance beginning in 1991 (returning as age-3 herring) in the AYK districts (DuBois 2002). Larger, older-aged herring are targeted by the mesh size of gillnets utilized in the commercial fishery. In the Nunivak Island District where purse seine gear was used, the commercial harvest was composed of age-5, -6 and -9 herring, an age composition similar to the VMG catches.

Age 6 and older herring typically arrive and spawn earlier than younger herring (Figure 11). This temporal spawning segregation has been observed in previous years (DuBois 2002). Many districts were ice free earlier than normal which contributed to the spring spawning migration timing being slightly early to normal in 2002.

Mean length at age from samples collected in all districts ranged from 172 mm for age-2 herring to 341 mm for age-17 herring (Appendices A.1-19). Mean length by district, based on VMG catches, ranged from 242 mm in the Cape Avinof District to 261mm in the Goodnews Bay District with an overall mean length of 251mm for all districts. Mean length by district within age classes generally decreases in a southerly to northerly direction (DuBois 2002).

In the VMG catches, males outnumbered females in most districts (Appendices A.11-19). The percentages of male herring captured in VMG catches were: 56.5% in Security Cove, 52.8% in Goodnews Bay, 49.1% in Cape Avinof, 48.4% in Nelson Island, 58.9% in Cape Romanzof, 56.0% in Norton Sound, and 54.0% for all AYK districts combined. Females outnumbered males in all the commercial gillnet harvest samples except Goodnews Bay (Appendices A.1-10). Typically females outnumber males in the commercial harvest (DuBois 2002). The percentages of male herring captured in commercial gillnets were: 43.8% in Security Cove, 50.5% in Goodnews Bay, 36.0% in Cape Avinof, 42.3% in Nelson Island, 34.8% in Cape Romanzof, 40.3% in Norton Sound, and 39.3% for all AYK districts combined.

## LITERATURE CITED

- ADF&G (Alaska Department of Fish and Game). 2000. 2000-2001 Commercial herring fishing regulations, Alaska Department of Fish and Game, Division of Commercial Fisheries, Juneau.
- Barton, L. H. and D. L. Steinhoff. 1980. Assessment of spawning herring (*Clupea harengus pallasi*) stocks at selected coastal areas in the eastern Bering Sea. Alaska Department of Fish and Game, Division of Commercial Fisheries, Informational Leaflet 187, Juneau.
- DuBois, L. 2002. Age, sex, and size composition of Pacific herring from coastal Bering Sea spawning sites in the Arctic-Yukon-Kuskokwim Region, 2001. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 3A02-18, Anchorage.
- Hamner, H.H. and J.F. Bromaghin. 1999. Forecast of stock abundance for 2000 Arctic-Yukon-Kuskokwim Region herring fisheries. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 3A99-40, Anchorage.
- Lebida, R. C. and D. C. Whitmore. 1985. Bering Sea herring aerial survey manual. Alaska Department of Fish and Game, Division of Commercial Fisheries, Bristol Bay Data Report 85-2, Anchorage.
- McBride, D., C. Whitmore, and D. Bergstrom. 1981. Age, sex, and size composition of Pacific herring, *Clupea harengus pallasi* (*Valenciennes*) from selected coastal spawning sites along the eastern Bering Sea, 1979-1980. Alaska Department of Fish and Game, Division of Commercial Fisheries, Technical Data Report 61, Juneau.
- Thompson, S. K. 1987. Sample size for estimating multinomial proportions. *The American Statistician* 41, 42-46.

Table 1. Age composition of Pacific herring run, commercial harvest, and escapement biomass for districts within the Arctic-Yukon-Kuskokwim Region, Alaska, 2002.

Security Cove		Goodnews Bay		Cape Avinof		Nelson Island		Nunivak Island		Cape Romanzof		Norton Sound		Arctic-Yukon- Kuskokwim		
Age	% by weight	tons	% by weight	tons	% by weight	tons	% by weight	tons	% by weight	tons	% by weight	tons	% by weight	tons	% by weight	tons
<b>Run</b>																
2	0.0	0	0.0	0	0.0	1	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1
3	0.0	0	0.0	0	0.7	23	0.2	10	0.2	10	0.0	0	0.1	17	0.1	60
4	1.4	68	1.6	86	3.8	133	2.1	128	2.5	134	1.5	52	1.8	490	2.0	1,092
5	40.0	1,897	33.7	1,866	53.8	1,877	28.0	1,716	33.1	1,795	29.0	1,043	31.3	8,469	33.3	18,663
6	22.8	1,083	19.9	1,103	20.1	703	16.6	1,018	19.5	1,059	18.6	669	26.1	7,060	22.7	12,695
7	4.2	197	4.4	245	4.4	154	3.5	216	3.8	206	6.0	216	6.2	1,680	5.2	2,914
8	2.0	95	2.0	110	3.1	108	5.8	356	5.8	317	1.6	58	6.7	1,811	5.1	2,854
9	10.2	483	12.7	700	6.3	222	20.1	1,234	18.1	982	18.6	670	9.6	2,592	12.3	6,883
10	2.5	117	2.9	159	2.4	83	4.8	296	4.6	247	1.6	58	5.9	1,605	4.6	2,586
11	7.7	364	9.9	548	1.5	52	9.3	571	7.6	411	12.8	461	6.1	1,659	7.3	4,064
12	2.7	127	3.5	195	1.6	56	4.9	299	2.6	142	3.9	140	2.9	793	3.1	1,751
13+	6.7	316	9.4	519	2.3	79	4.7	286	2.2	118	6.5	233	3.3	892	4.4	2,444
Total	100.0	4,748	100.0	5,529	100.0	3,491	100.0	6,130	100.0	5,422	100.0	3,600	100.0	27,068	100.0	55,988
<b>Commercial Harvest</b>																
2	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
3	0.0	0	0.0	0	0.0	0	0.0	0	0.1	0	0.0	0	0.0	0	0.0	0
4	0.0	0	0.0	0	0.0	0	0.0	0	0.9	2	0.0	0	0.0	0	0.1	2
5	1.1	1	2.7	0	1.9	1	0.1	1	45.2	79	0.0	0	0.5	5	3.5	88
6	9.2	9	11.8	2	8.0	8	0.6	6	23.5	41	0.1	0	2.0	22	3.4	86
7	6.9	7	7.9	1	4.0	3	2.0	19	4.5	8	0.6	1	2.2	25	2.5	64
8	7.2	7	4.7	1	4.6	4	5.7	54	2.3	4	1.4	1	9.7	109	7.1	180
9	28.0	28	38.2	5	32.5	26	31.1	296	12.8	22	20.2	20	21.2	238	25.0	635
10	11.9	12	2.9	0	11.2	9	6.3	60	3.1	5	3.6	4	14.7	165	10.0	255
11	15.8	16	15.1	2	17.6	14	18.8	179	4.8	8	27.7	28	25.0	280	20.7	527
12	9.7	10	4.8	1	11.0	9	17.2	163	1.2	2	14.3	14	13.6	153	13.8	351
13+	10.3	10	11.8	2	9.4	7	18.2	173	1.6	3	32.1	32	11.1	124	13.8	352
Total	100.0	99	100.0	13	100.0	79	100.0	950	100.0	176	100.0	100	100.0	1,123	100.0	2,540
<b>Escapement</b>																
2	0.0	0	0.0	0	0.0	1	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1
3	0.0	0	0.0	0	0.7	23	0.2	10	0.2	10	0.0	0	0.1	17	0.1	60
4	1.5	68	1.6	86	3.9	133	2.5	128	2.5	133	1.5	52	1.9	490	2.0	1,091
5	40.8	1,896	33.8	1,865	55.0	1,876	33.1	1,715	32.7	1,716	29.8	1,043	32.6	8,464	34.8	18,575
6	23.1	1,074	20.0	1,101	20.4	697	19.5	1,012	19.4	1,016	19.1	669	27.1	7,037	23.6	12,608
7	4.1	190	4.4	244	4.4	151	3.8	197	3.8	198	6.2	215	6.4	1,655	5.3	2,850
8	1.9	87	2.0	110	3.1	104	5.8	302	6.0	312	1.6	57	6.6	1,701	5.0	2,674
9	9.8	455	12.6	695	5.7	196	18.1	938	18.3	960	18.6	650	9.1	2,354	11.7	6,247
10	2.3	106	2.9	159	2.2	75	4.6	236	4.6	242	1.6	54	5.6	1,440	4.3	2,311
11	7.5	348	9.9	544	1.1	38	7.6	393	7.7	403	12.4	433	5.3	1,379	6.6	3,538
12	2.5	117	3.5	194	1.4	47	2.6	136	2.7	140	3.6	125	2.5	640	2.6	1,400
13+	6.6	306	9.4	518	2.1	71	2.2	113	2.2	115	5.8	201	3.0	768	3.9	2,092
Total	100.0	4,649	100.0	5,516	100.0	3,412	100.0	5,180	100.0	5,246	100.0	3,500	100.0	25,946	100.0	53,448

Table 2. Percent age composition of Pacific herring spawning abundance, in number of fish, for districts within the Arctic-Yukon-Kuskokwim Region, Alaska, 2002.

<u>Age</u>	<u>Security Cove</u>	<u>Goodnews Bay</u>	<u>Cape Avinof</u>	<u>Nelson Island</u>	<u>Nunivak Island</u>	<u>Cape Romanzof</u>	<u>Norton Sound</u>	<u>Arctic-Yukon Kuskokwim</u>
2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	1.5	0.5	0.5	0.0	0.1	0.3
4	2.6	2.9	5.7	3.9	4.4	2.7	3.1	3.4
5	51.1	45.8	61.6	38.0	42.7	39.2	41.3	43.7
6	23.3	21.8	18.0	17.6	19.7	20.1	27.3	23.6
7	3.6	4.1	3.3	3.4	3.4	6.0	5.6	4.7
8	1.5	1.6	2.0	5.0	4.8	1.4	5.0	4.0
9	6.8	8.9	3.9	15.6	13.3	14.3	6.6	8.7
10	1.5	1.8	1.3	3.5	3.2	1.1	3.8	3.0
11	4.6	6.0	0.8	6.4	5.0	8.8	3.7	4.5
12	1.5	2.0	0.8	3.2	1.6	2.5	1.6	1.8
13+	3.5	5.1	1.0	2.9	1.3	3.9	1.8	2.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

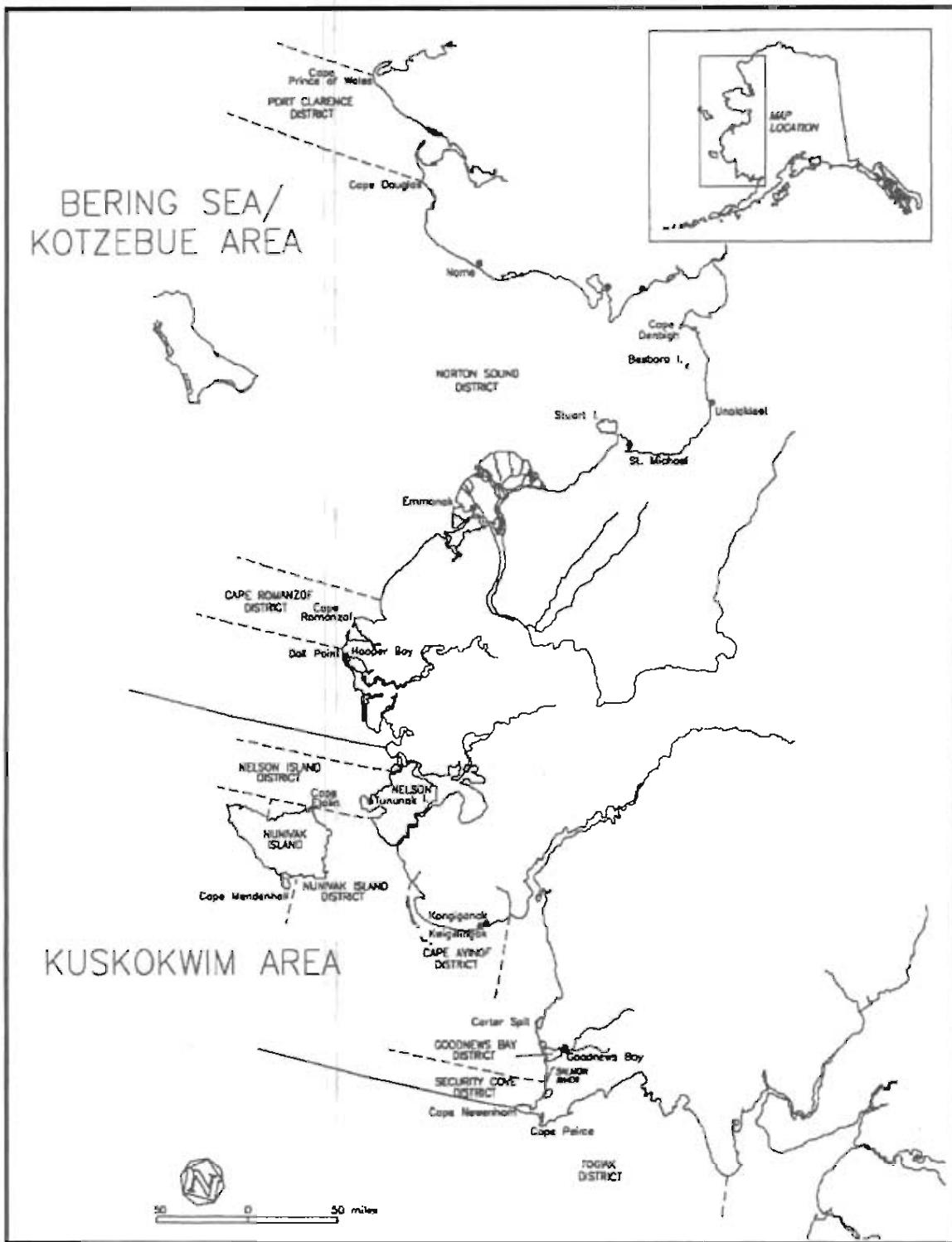


Figure 1. Commercial herring fishing districts within the Arctic-Yukon-Kuskokwim Region, Alaska, 2002.

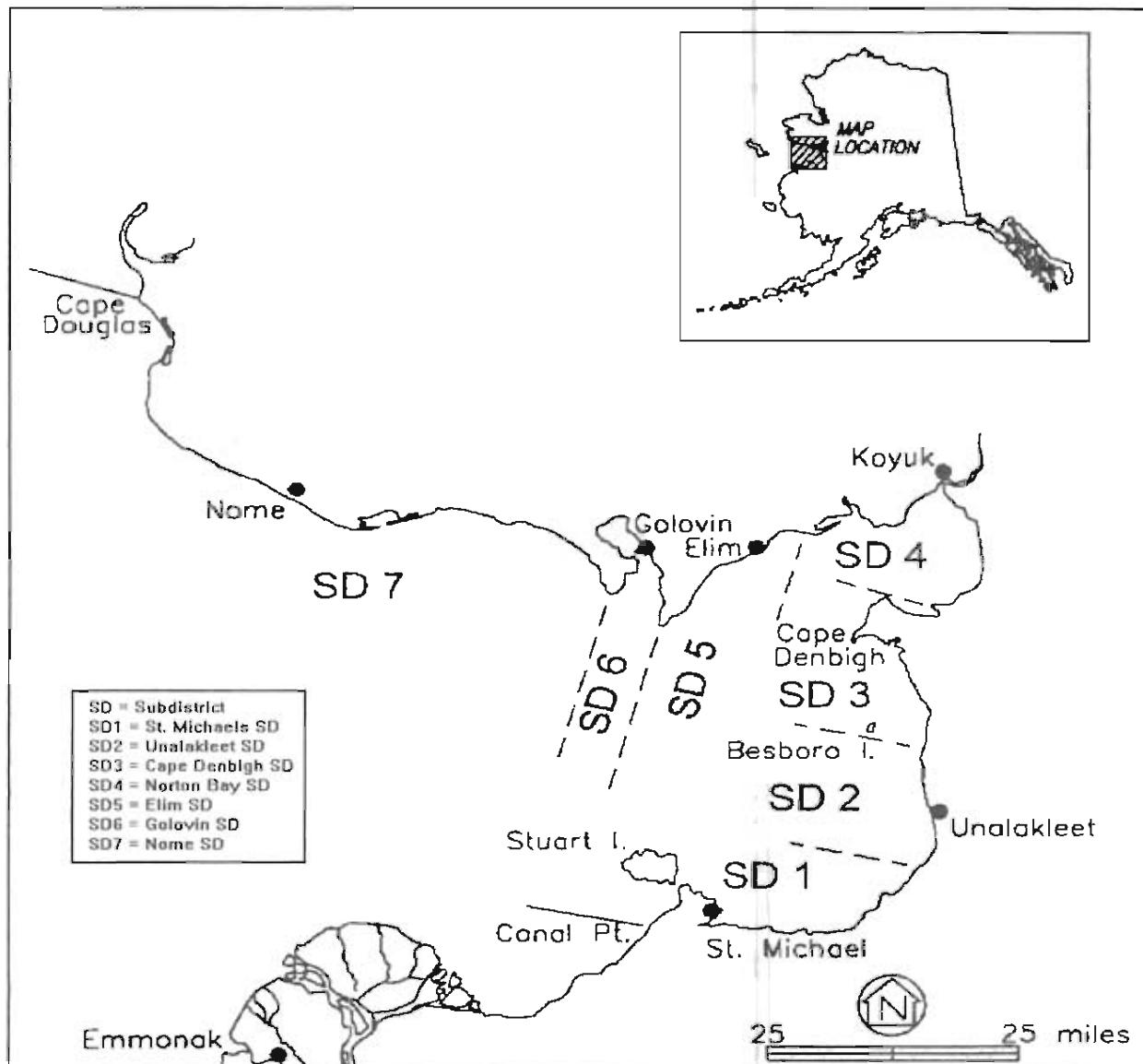
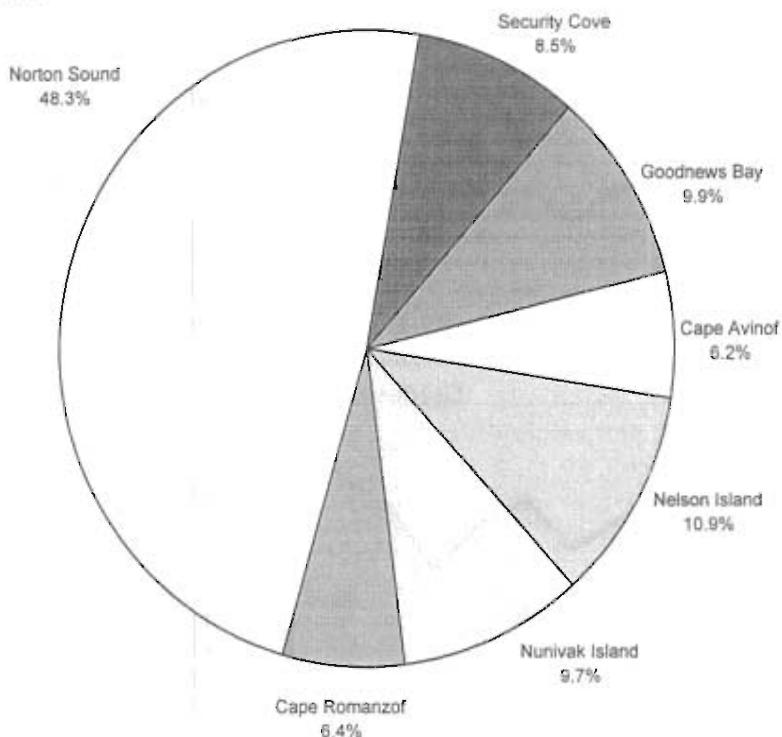


Figure 2. Commercial herring fishing subdistricts within the Norton Sound District, Arctic-Yukon-Kuskokwim Region, Alaska, 2002.

### Run Biomass



### Commercial Harvest

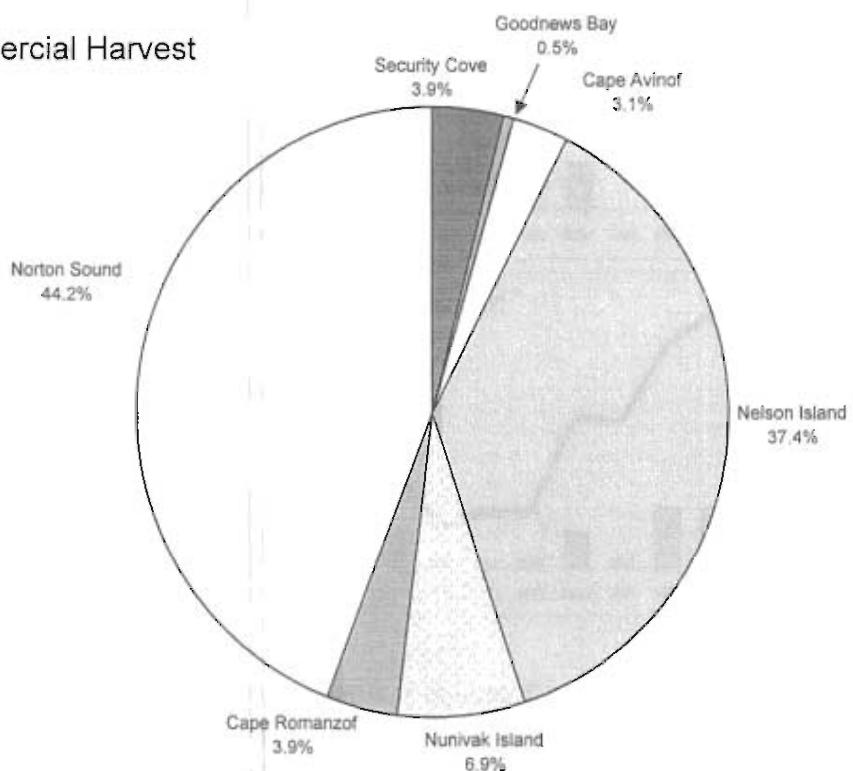


Figure 3. Pacific herring run biomass and commercial harvest distribution by commercial fishing district, Arctic-Yukon-Kuskokwim Region, Alaska, 2002.

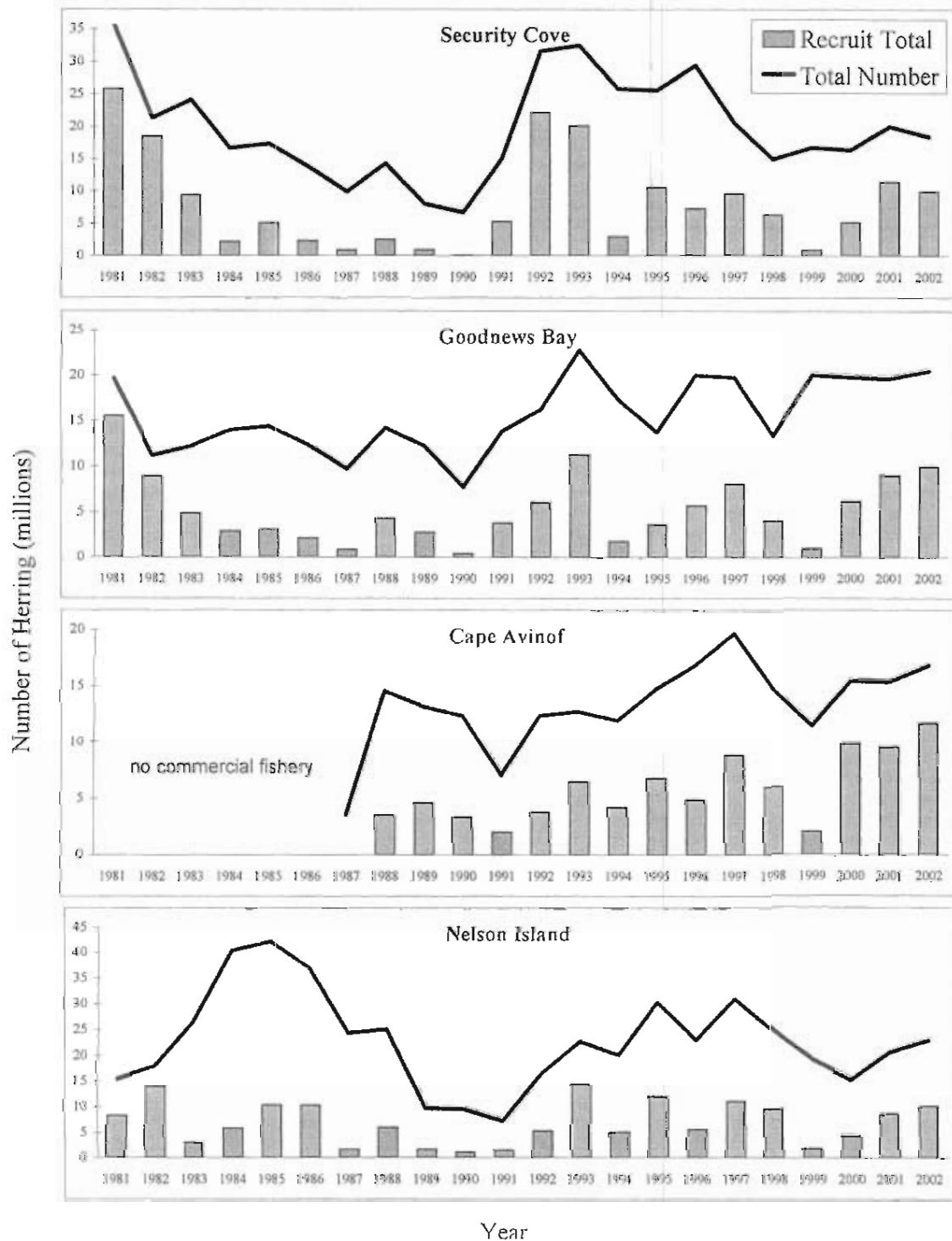


Figure 4. Pacific herring recruits, ages 2 through 5, compared to the total population from 1981 through 2002 for Security Cove, Goodnews Bay, Cape Avinof, and Nelson Island districts within the Arctic-Yukon-Kuskokwim Region, Alaska.

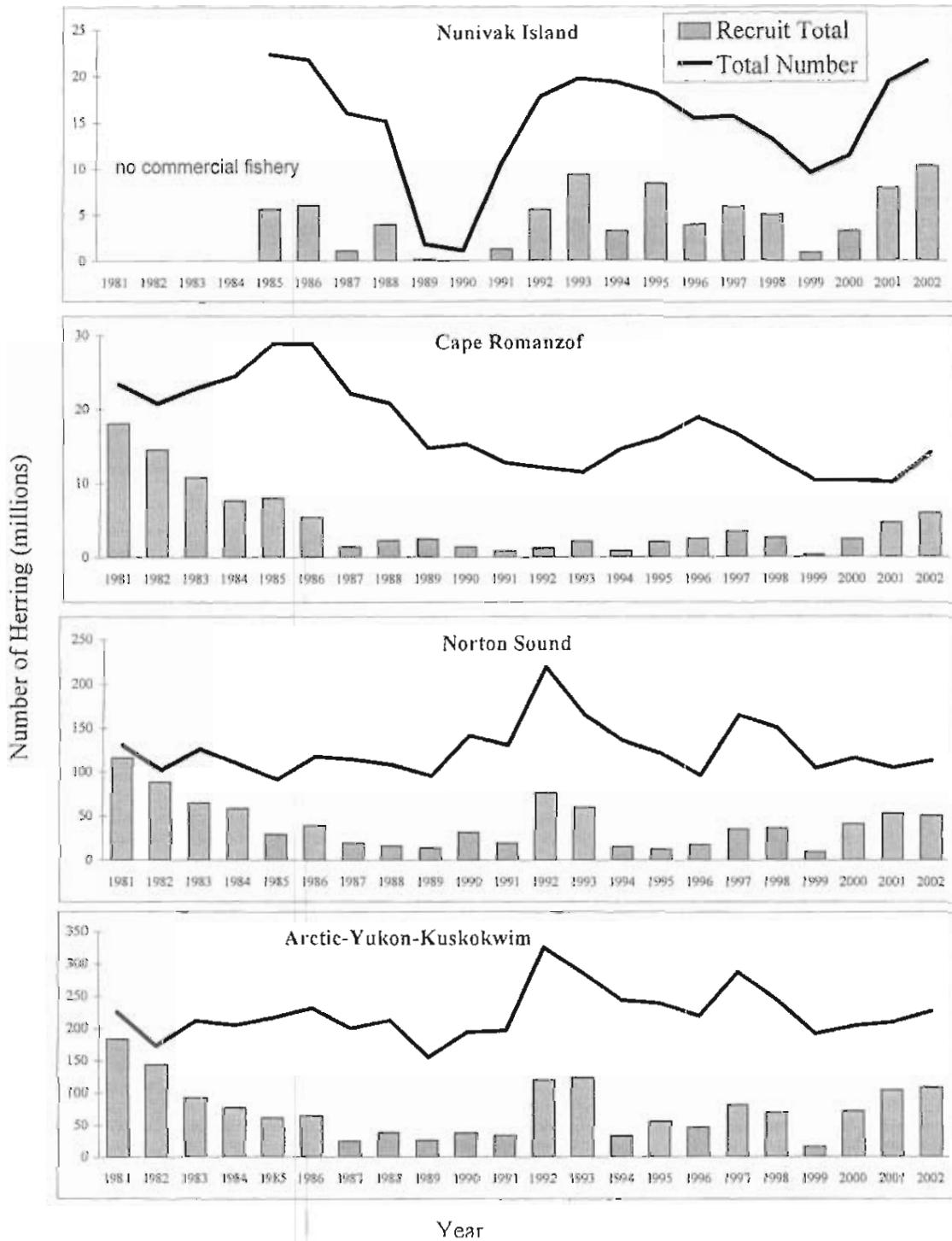


Figure 5. Pacific herring recruits, ages 2 through 5, compared to the total population from 1981 through 2002 for Nunivak Island, Cape Romanzof, and Norton Sound districts, and the combined Arctic-Yukon-Kuskokwim Region, Alaska.

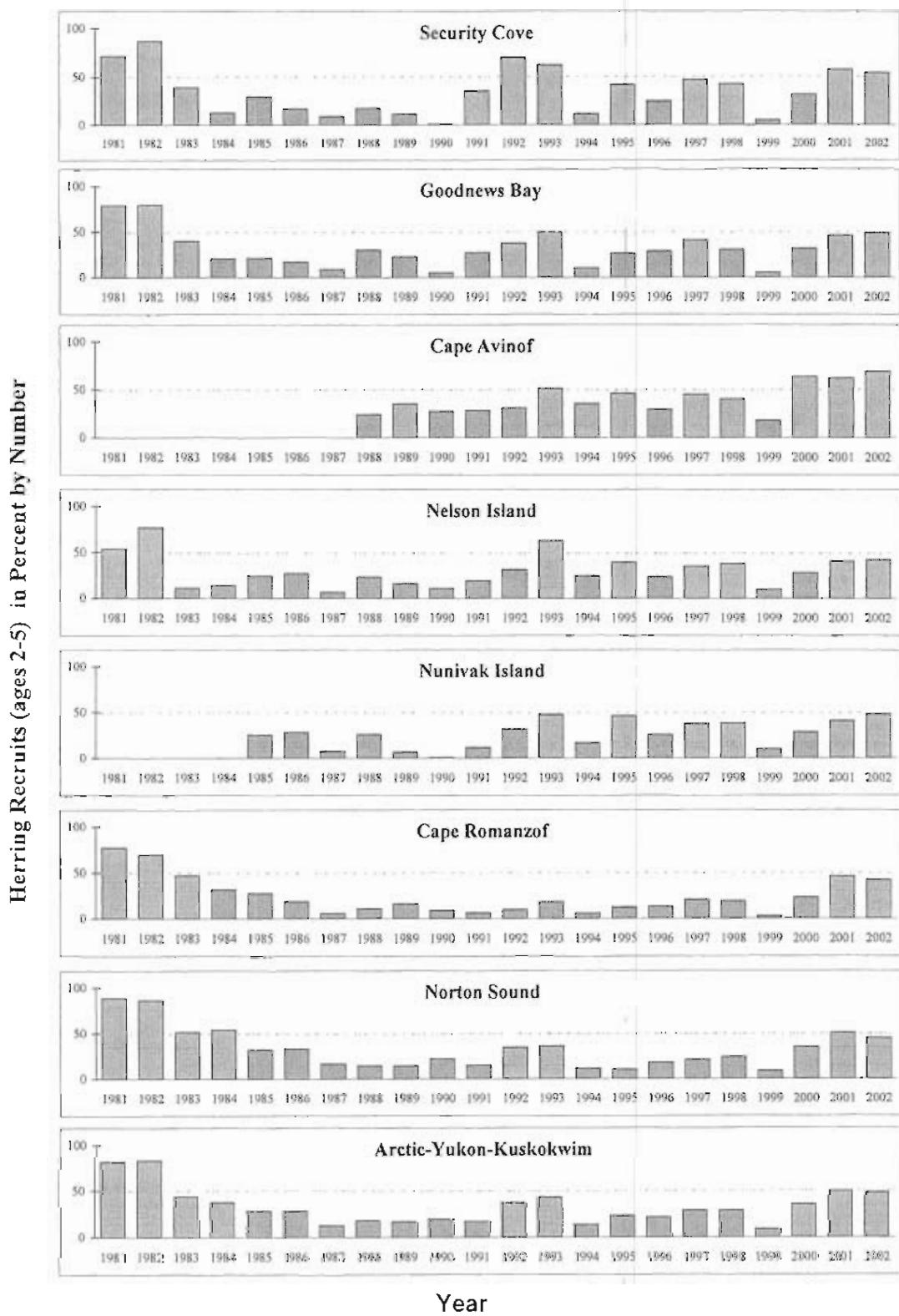


Figure 6. Pacific herring recruits, ages 2 through 5, as a percentage of the total population, from 1981 through 2002 for commercial fishing districts within the Arctic-Yukon-Kuskokwim Region, Alaska.

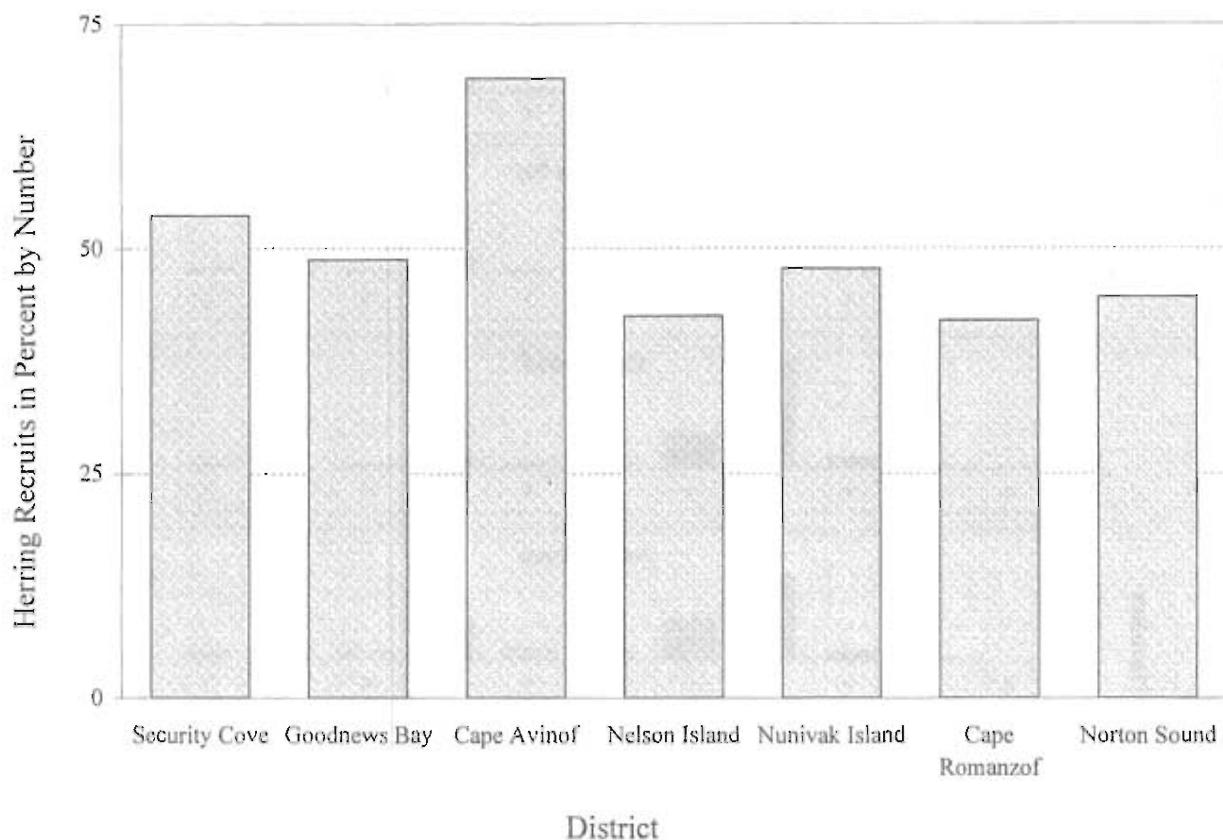


Figure 7. Pacific herring recruits (ages 2 through 5) for commercial fishing districts within the Arctic-Yukon-Kuskokwim Region, Alaska, 2002.

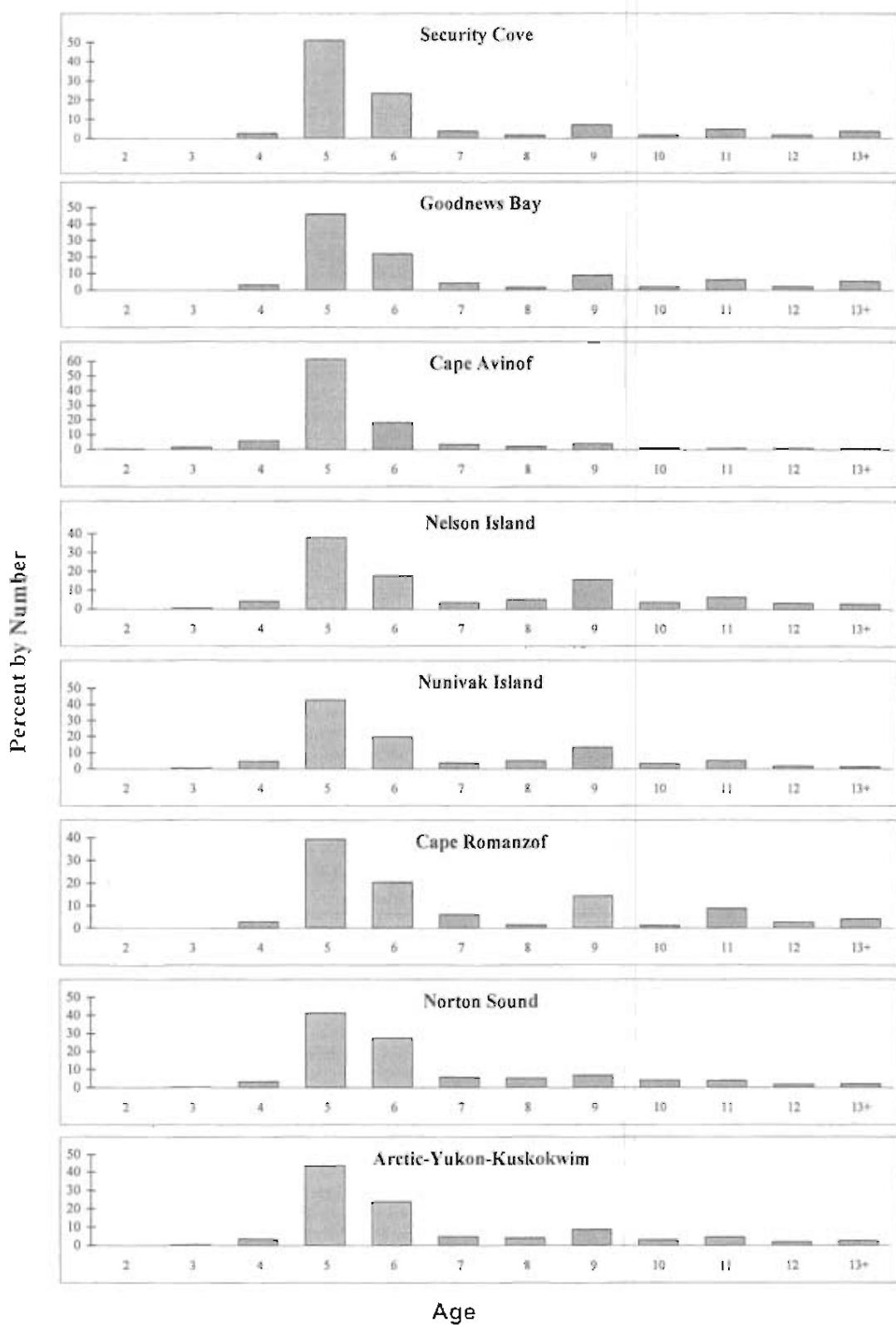


Figure 8. Age composition of Pacific herring spawning populations for commercial fishing districts within the Arctic-Yukon-Kuskokwim Region, Alaska, 2002.

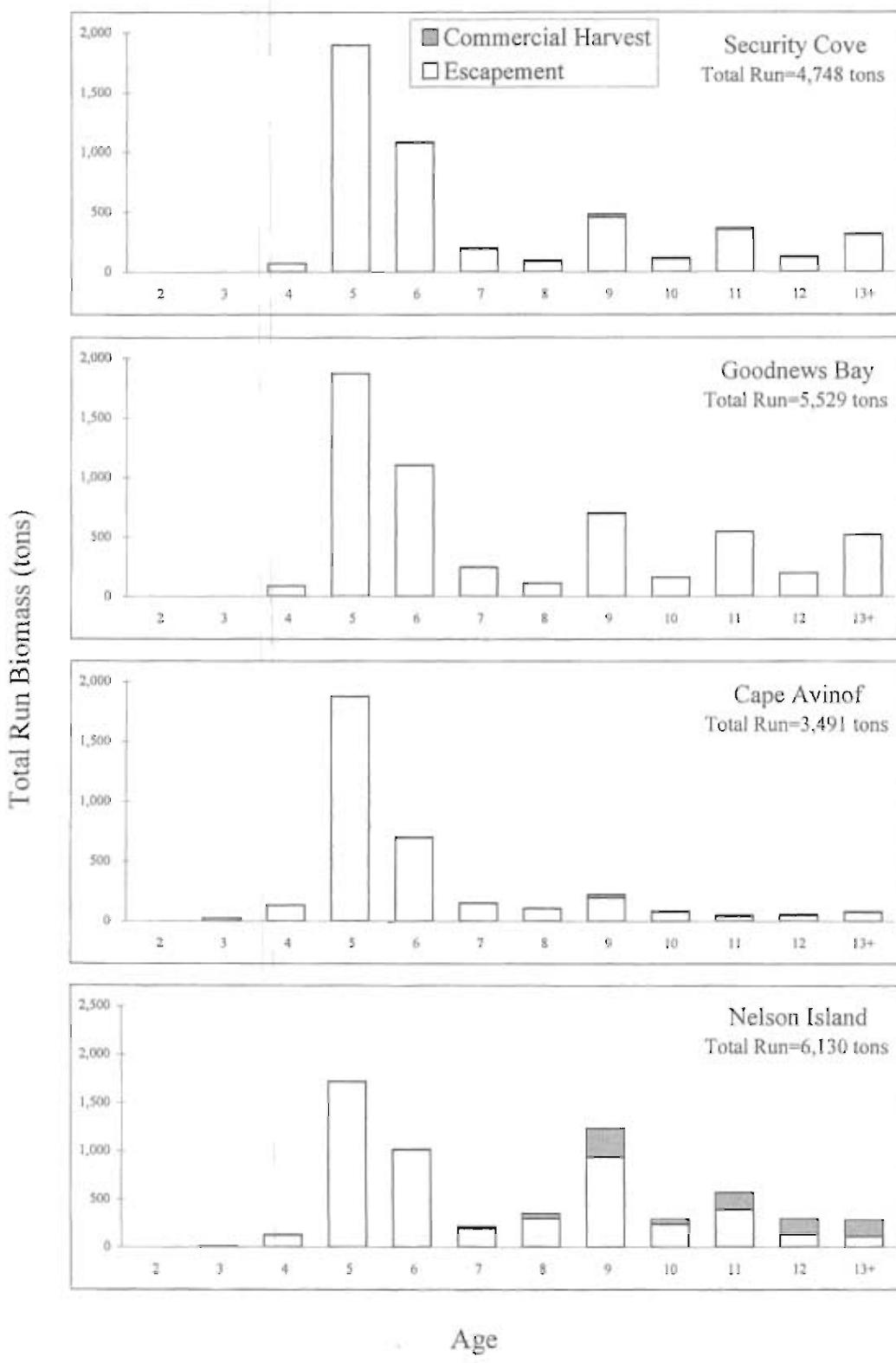


Figure 9. Abundance by age of Pacific herring for the total run, escapement and harvest biomass for the Security Cove, Goodnews Bay, Cape Avinof, and Nelson Island districts within the Arctic-Yukon-Kuskokwim Region, Alaska, 2002.

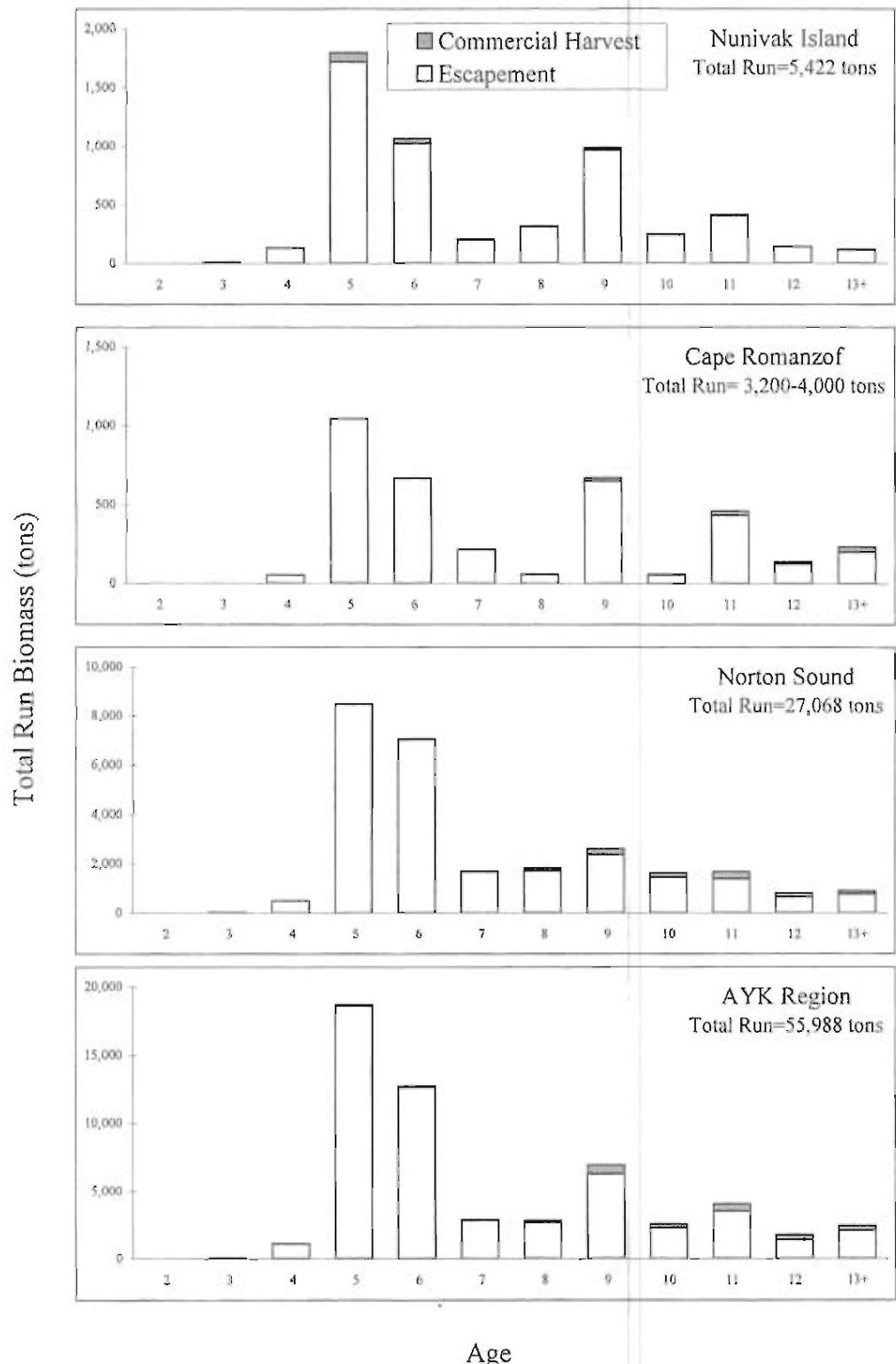


Figure 10. Abundance by age of Pacific herring for the total run, escapement and harvest biomass for the Nunivak Island, Cape Romanzof, Norton Sound districts, and the combined Arctic-Yukon-Kuskokwim Region, Alaska, 2002.

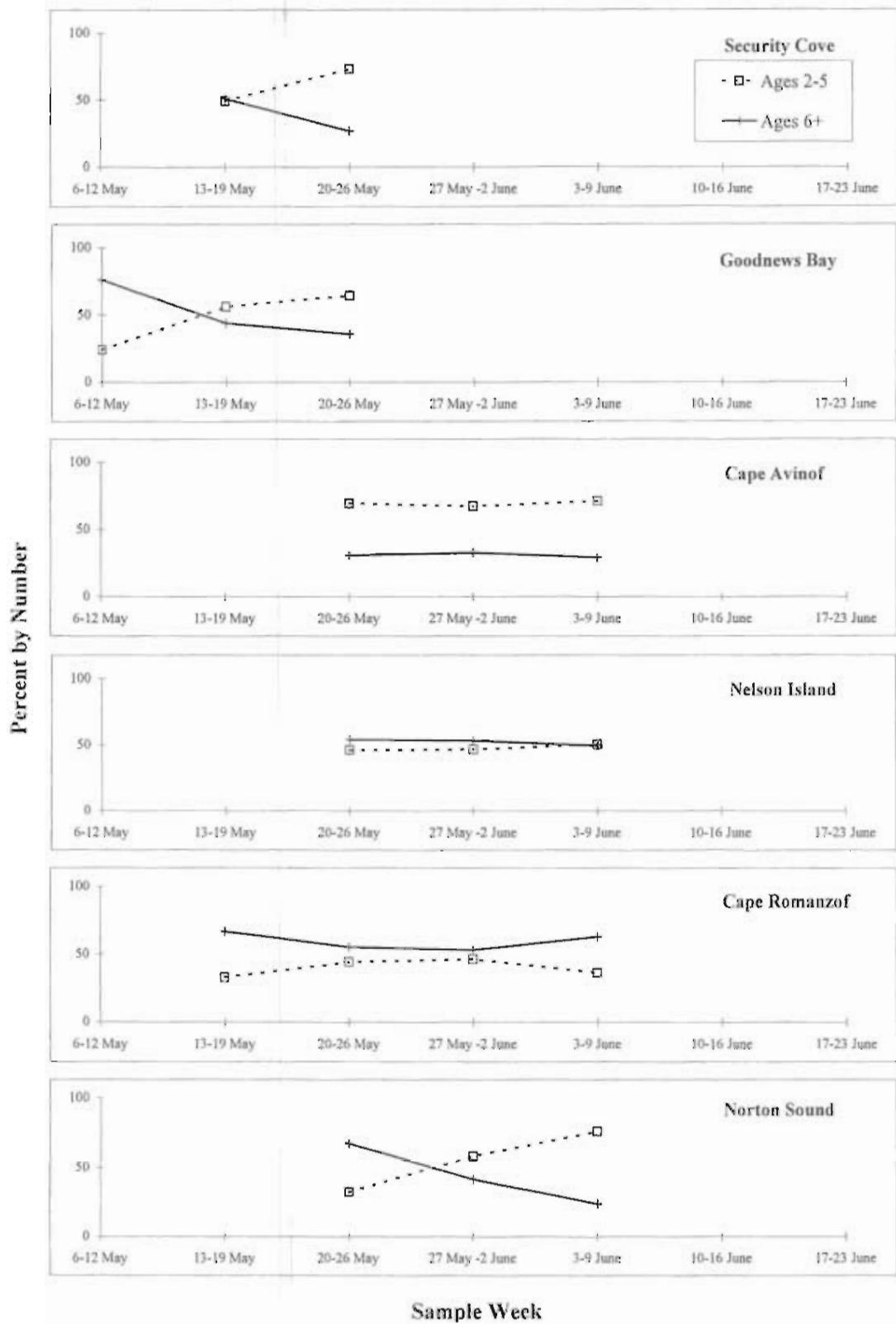


Figure 11. Spawning time comparison (based on variable-mesh gillnet data) of Pacific herring, grouped by ages 2 to 5 and age 6 and older, for districts within the Arctic-Yukon-Kuskokwim Region, Alaska, 2002.

Appendix A.1. Age, sex, and size composition of herring sampled from the commercial gillnet harvest,  
Security Cove District, 15 May, 2002.

Sample Dates	Age	Sex (number)				Percent of Total	Weight		Length			
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
15 May	2											
	3											
	4											
	5	0	2	0	2	2.0	0		0	260	2.8	2
	6	4	10	0	14	13.7	0		0	267	9.4	14
	7	4	5	0	9	8.8	0		0	275	12.0	9
	8	3	5	0	8	7.8	0		0	289	8.2	8
	9	11	17	0	28	27.5	0		0	288	10.8	28
	10	9	2	0	11	10.8	0		0	297	9.7	11
	11	6	8	0	14	13.7	0		0	306	10.3	14
	12	3	5	0	8	7.8	0		0	311	11.3	8
	13	0	1	0	1	1.0	0		0	314		1
	14	3	3	0	6	5.9	0		0	314	8.5	6
	15											
	16	0	1	0	1	1.0	0		0	316		1
	17											
Sample Total		43	59	0	102	100.0	0		0	291	18.1	102
Sex Composition		42.2	57.8									
Unaged		20	22	0	42	41.2	0		0	295	14.0	42
Sex Composition		47.6	52.4									

Appendix A.2. Age, sex, and size composition of herring sampled from the commercial gillnet harvest, Goodnews Bay District, 15-17 May, 2002.

Sample Dates	Age	Sex (number)				Percent of Total	Weight		Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD
15 May	2										
	3										
	4										
	5	2	0	0	2	6.3	0		0	268	38.9
	6	1	3	0	4	12.5	0		0	263	6.5
	7	1	2	0	3	9.4	0		0	270	5.0
	8	0	1	0	1	3.1	0		0	295	
	9	6	4	0	10	31.3	0		0	294	12.7
	10	0	2	0	2	6.3	0		0	303	3.5
	11	4	2	0	6	18.8	0		0	296	9.7
	12	1	0	0	1	3.1	0		0	280	
	13	1	0	0	1	3.1	0		0	315	
	14	2	0	0	2	6.3	0		0	308	3.5
	15										
	16										
	17										
Sample Total		18	14	0	32	100.0	0		0	288	18.6
											32
17 May	2										
	3										
	4										
	5	0	2	0	2	4.1	0		0	245	14.8
	6	5	5	0	10	20.4	0		0	256	7.5
	7	3	2	0	5	10.2	0		0	265	7.4
	8	1	2	0	3	6.1	0		0	281	6.4
	9	10	9	0	19	38.8	0		0	287	11.3
	10										
	11	1	3	0	4	8.2	0		0	298	5.0
	12	1	1	0	2	4.1	0		0	304	4.2
	13	0	1	0	1	2.0	0		0	309	
	14	1	1	0	2	4.1	0		0	304	8.5
	15										
	16										
	17	0	1	0	1	2.0	0		0	341	
Sample Total		22	27	0	49	100.0	0		0	280	21.5
											49
All Dates Combined 15-17 May	2										
	3										
	4										
	5	2	2	0	4	4.9	0		0	256	27.5
	6	6	8	0	14	17.3	0		0	258	7.7
	7	4	4	0	8	9.9	0		0	267	6.8
	8	1	3	0	4	4.9	0		0	285	8.6
	9	16	13	0	29	35.8	0		0	289	12.0
	10	0	2	0	2	2.5	0		0	303	3.5
	11	5	5	0	10	12.3	0		0	297	7.8
	12	2	1	0	3	3.7	0		0	296	14.2
	13	1	1	0	2	2.5	0		0	312	4.2
	14	3	1	0	4	4.9	0		0	306	5.7
	15										
	16										
	17	0	1	0	1	1.2	0		0	341	
All Samples Combined Sex Composition		40	41	0	81	100.0	0		0	283	20.7
		49.4	50.6								81
Unaged Sex Composition		11	9	0	20	24.7	0		0	285	19.2
		55.0	45.0								20

Appendix A.3. Age, sex, and size composition of herring sampled from the commercial gillnet harvest,  
Cape Avinof District, 26 May - 2 June, 2002.

Sample Dates	Age	Sex (number)			Percent of Total	Weight			Length		
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
26 May	2										
	3										
	4										
	5	0	5	0	5	5.4	0	0	247	9.0	5
	6	1	9	0	10	10.8	0	0	261	6.5	10
	7	1	2	0	3	3.2	0	0	268	6.7	3
	8	1	5	0	6	6.5	0	0	278	11.6	6
	9	12	21	0	33	35.5	0	0	278	10.8	33
	10	5	8	0	13	14.0	0	0	292	9.1	13
	11	7	7	0	14	15.1	0	0	291	10.7	14
	12	1	4	0	5	5.4	0	0	306	4.7	5
	13	1	2	0	3	3.2	0	0	309	7.9	3
	14	0	1	0	1	1.1	0	0	312		1
	15										
	16										
	17										
Sample Total		29	64	0	93	100.0	0	0	281	17.5	93
27 May	2										
	3										
	4										
	5	0	2	0	2	4.4	0	0	236	3.5	2
	6	1	4	0	5	11.1	0	0	260	4.0	5
	7	0	1	0	1	2.2	0	0	259		1
	8	1	1	0	2	4.4	0	0	275	4.2	2
	9	2	7	0	9	20.0	0	0	289	12.0	9
	10	3	3	0	6	13.3	0	0	297	7.8	6
	11	4	7	0	11	24.4	0	0	301	7.5	11
	12	1	2	0	3	6.7	0	0	303	7.5	3
	13										
	14	1	3	0	4	8.9	0	0	319	5.9	4
	15	1	0	0	1	2.2	0	0	320		1
	16	0	1	0	1	2.2	0	0	312		1
	17										
Sample Total		14	31	0	45	100.0	0	0	291	22.0	45
28 May	2										
	3										
	4										
	5	1	1	0	2	2.9	0	0	239	20.5	2
	6	2	4	0	6	8.6	0	0	270	10.4	6
	7	0	4	0	4	5.7	0	0	270	12.9	4
	8	2	0	0	2	2.9	0	0	283	13.4	2
	9	12	16	0	28	40.0	0	0	290	10.2	28
	10	4	2	0	6	8.6	0	0	297	11.4	6
	11	6	2	0	8	11.4	0	0	303	10.9	8
	12	4	7	0	11	15.7	0	0	305	6.9	11
	13	0	1	0	1	1.4	0	0	301		1
	14	1	1	0	2	2.9	0	0	307	2.8	2
	15										
	16										
	17										
Sample Total		32	38	0	70	100.0	0	0	291	17.3	70

-Continued-

## Appendix A.3. (p. 2 of 3)

Sample Dates	Age	Sex (number)			Percent of Total	Weight		Length			
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
29 May	2										
	3										
	4										
	5										
	6	0	2	0	2	12.5	0	0	270	7.8	2
	7	1	0	0	1	6.3	0	0	274		1
	8	1	0	0	1	6.3	0	0	285		1
	9	6	1	0	7	43.8	0	0	288	11.5	7
	10										
	11	0	1	0	1	6.3	0	0	307		1
	12	3	0	0	3	18.8	0	0	273	35.6	3
	13										
	14	0	1	0	1	6.3	0	0	324		1
	15										
	16										
	17										
Sample Total		11	5	0	16	100.0	0	0	285	20.8	16
31 May	2										
	3										
	4										
	5	0	1	0	1	2.9	0	0	247		1
	6	3	7	0	10	29.4	0	0	276	6.4	10
	7	0	1	0	1	2.9	0	0	279		1
	8	1	1	0	2	5.9	0	0	285	7.8	2
	9	4	5	0	9	26.5	0	0	292	13.6	9
	10	1	1	0	2	5.9	0	0	317	20.5	2
	11	2	4	0	6	17.6	0	0	304	10.7	6
	12	0	1	0	1	2.9	0	0	316		1
	13	1	0	0	1	2.9	0	0	318		1
	14	0	1	0	1	2.9	0	0	327		1
	15										
	16										
	17										
Sample Total		12	22	0	34	100.0	0	0	291	19.2	34
2 June	2										
	3										
	4										
	5										
	6										
	7	3	1	0	4	23.5	0	0	281	2.6	4
	8	0	1	0	1	5.9	0	0	267		1
	9	3	3	0	6	35.3	0	0	293	8.3	6
	10	0	1	0	1	5.9	0	0	312		1
	11	0	1	0	1	5.9	0	0	314		1
	12	1	0	0	1	5.9	0	0	313		1
	13	0	1	0	1	5.9	0	0	321		1
	14	0	2	0	2	11.8	0	0	327	6.4	2
	15										
	16										
	17										
Sample Total		7	10	0	17	100.0	0	0	298	18.6	17

-Continued-

Appendix A.3. (p. 3 of 3)

Sample Dates	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	2											
	3											
	4											
All Dates Combined	5	1	9	0	10	3.6	0		0	243	10.6	10
26 May - 2 June	6	7	26	0	33	12.0	0		0	267	9.6	33
	7	5	9	0	14	5.1	0		0	273	9.5	14
	8	6	8	0	14	5.1	0		0	279	9.7	14
	9	39	53	0	92	33.5	0		0	286	12.3	92
	10	13	15	0	28	10.2	0		0	297	11.6	28
	11	19	22	0	41	14.9	0		0	299	11.1	41
	12	10	14	0	24	8.7	0		0	302	16.5	24
	13	2	4	0	6	2.2	0		0	311	8.8	6
	14	2	9	0	11	4.0	0		0	319	8.3	11
	15	1	0	0	1	0.4	0		0	320		1
	16	0	1	0	1	0.4	0		0	312		1
	17											
All Samples Combined		105	170	0	275	100.0	0		0	288	19.3	275
Sex Composition		38.2	61.8									
Unaged		37	82	0	119	43.3	0		0	291	14.3	119
Sex Composition		31.1	68.9									

Appendix A.4. Age, sex, and size composition of herring sampled from the commercial purse seine harvest, Nunivak Island District, 19-25 May, 2002.

Sample Dates	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
19 May	2											
	3											
	4											
	5	13	19	0	32	46.4	0		0	239	6.9	32
	6	12	9	0	21	30.4	0		0	254	8.1	21
	7	2	1	0	3	4.3	0		0	266	1.7	3
	8											
	9	5	1	0	6	8.7	0		0	287	8.0	6
	10	1	0	0	1	1.4	0		0	279		1
	11	1	2	0	3	4.3	0		0	291	5.6	3
	12	1	0	0	1	1.4	0		0	297		1
	13	1	0	0	1	1.4	0		0	295		1
	14	0	1	0	1	1.4	0		0	314		1
	15											
	16											
	17											
Sample Total		36	33	0	69	100.0	0		0	254	20.7	69
20 May	2											
	3											
	4	1	0	0	1	1.0	0		0	208		1
	5	28	33	0	61	58.1	0		0	236	7.7	61
	6	7	13	0	20	19.0	0		0	251	8.2	20
	7	0	3	0	3	2.9	0		0	256	13.2	3
	8	3	1	0	4	3.8	0		0	277	4.7	4
	9	2	6	0	8	7.6	0		0	283	6.5	8
	10	0	1	0	1	1.0	0		0	294		1
	11	2	3	0	5	4.8	0		0	295	4.4	5
	12	1	0	0	1	1.0	0		0	298		1
	13											
	14	1	0	0	1	1.0	0		0	318		1
	15											
	16											
	17											
Sample Total		45	60	0	105	100.0	0		0	249	21.9	105
21 May	2											
	3	0	1	0	1	1.1	0		0	197		1
	4	2	2	0	4	4.3	0		0	208	5.4	4
	5	24	26	0	50	53.2	0		0	235	7.7	50
	6	9	13	0	22	23.4	0		0	248	11.0	22
	7	2	1	0	3	3.2	0		0	269	7.0	3
	8	1	1	0	2	2.1	0		0	275	1.4	2
	9	5	3	0	8	8.5	0		0	282	12.4	8
	10	2	1	0	3	3.2	0		0	290	3.2	3
	11	1	0	0	1	1.1	0		0	299		1
	12											
	13											
	14											
	15											
	16											
	17											
Sample Total		46	48	0	94	100.0	0		0	245	21.6	94

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Appendix A.4. (p. 2 of 2)

Sample Dates	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
22 May	2											
	3											
	4	0	1	0	1	1.0	0		0	213		1
	5	31	34	0	65	63.1	0		0	236	7.0	65
	6	12	12	0	24	23.3	0		0	250	12.6	24
	7	1	0	0	1	1.0	0		0	274		1
	8	1	0	0	1	1.0	0		0	284		1
	9	5	2	0	7	6.8	0		0	286	3.3	7
	10	1	1	0	2	1.9	0		0	291	4.9	2
	11	0	1	0	1	1.0	0		0	292		1
	12	1	0	0	1	1.0	0		0	301		1
	13											
	14											
	15											
	16											
	17											
Sample Total		52	51	0	103	100.0	0		0	246	19.1	103
25 May	2											
	3											
	4	1	0	0	1	1.4	0		0	204		1
	5	16	18	0	34	48.6	0		0	238	8.8	34
	6	6	5	0	11	15.7	0		0	248	10.9	11
	7	1	6	0	7	10.0	0		0	268	11.8	7
	8	1	0	0	1	1.4	0		0	271		1
	9	5	5	0	10	14.3	0		0	286	11.0	10
	10	0	2	0	2	2.9	0		0	292	4.2	2
	11	1	2	0	3	4.3	0		0	306	9.7	3
	12											
	13	1	0	0	1	1.4	0		0	307		1
	14											
	15											
	16											
	17											
Sample Total		32	38	0	70	100.0	0		0	255	24.9	70
All Dates Combined 19-25 May	2											
	3	0	1	0	1	0.2	0		0	197		1
	4	4	3	0	7	1.6	0		0	208	4.7	7
	5	112	130	0	242	54.9	0		0	236	7.7	242
	6	46	52	0	98	22.2	0		0	250	10.4	98
	7	6	11	0	17	3.9	0		0	266	10.4	17
	8	6	2	0	8	1.8	0		0	276	4.7	8
	9	22	17	0	39	8.8	0		0	285	8.9	39
	10	4	5	0	9	2.0	0		0	290	5.1	9
	11	5	8	0	13	2.9	0		0	296	7.7	13
	12	3	0	0	3	0.7	0		0	299	2.1	3
	13	2	0	0	2	0.5	0		0	301	8.5	2
	14	1	1	0	2	0.5	0		0	316	2.8	2
	15											
	16											
	17											
All Samples Combined Sex Composition		211	230	0	441	100.0	0		0	249	21.9	441
Unaged Sex Composition		47.8	52.2									
		36	23	0	59	13.4	0		0	266	26.6	59
		61.0	39.0									

Appendix A.5. Age, sex, and size composition of herring sampled from the commercial gillnet harvest, Nelson Island District, 22-28 May, 2002.

Sample Dates	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
22 May	2											
	3											
	4											
	5	1	0	0	1	1.5	0		0	294		1
	6	2	0	0	2	3.0	0		0	278	1.4	2
	7	0	4	0	4	6.0	0		0	273	3.0	4
	8	2	7	0	9	13.4	0		0	280	18.5	9
	9	10	11	0	21	31.3	0		0	289	9.3	21
	10	1	3	0	4	6.0	0		0	284	19.4	4
	11	4	5	0	9	13.4	0		0	290	11.7	9
	12	3	8	0	11	16.4	0		0	302	6.8	11
	13	1	1	0	2	3.0	0		0	296	7.8	2
	14	3	1	0	4	6.0	0		0	308	9.0	4
	15											
	16											
	17											
Sample Total		27	40	0	67	100.0	0		0	290	14.0	67
23 May	2											
	3											
	4											
	5											
	6	0	1	0	1	1.3	0		0	281		1
	7	1	1	0	2	2.6	0		0	273	0.7	2
	8	0	1	0	1	1.3	0		0	278		1
	9	5	16	0	21	26.9	0		0	296	7.1	21
	10	4	1	0	5	6.4	0		0	308	9.2	5
	11	9	7	0	16	20.5	0		0	306	4.9	16
	12	6	12	0	18	23.1	0		0	308	6.9	18
	13	3	2	0	5	6.4	0		0	310	14.9	5
	14	4	5	0	9	11.5	0		0	311	10.2	9
	15											
	16											
	17											
Sample Total		32	46	0	78	100.0	0		0	303	11.3	78
24 May	2											
	3											
	4											
	5											
	6											
	7	0	1	0	1	1.2	0		0	286		1
	8	1	6	0	7	8.5	0		0	289	11.1	7
	9	14	15	0	29	35.4	0		0	292	9.8	29
	10	4	3	0	7	8.5	0		0	297	9.6	7
	11	4	5	0	9	11.0	0		0	302	13.9	9
	12	10	5	0	15	18.3	0		0	308	5.0	15
	13	2	2	0	4	4.9	0		0	319	8.6	4
	14	5	2	0	7	8.5	0		0	311	9.1	7
	15	2	1	0	3	3.7	0		0	326	15.7	3
	16											
	17											
Sample Total		42	40	0	82	100.0	0		0	300	13.8	82

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## Appendix A.5. (p. 2 of 3)

Sample Dates	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
25 May	2											
	3											
	4											
	5											
	6											
	7											
	8	1	5	0	6	8.5	0		0	284	6.9	6
	9	12	11	0	23	32.4	0		0	290	7.4	23
	10	2	1	0	3	4.2	0		0	298	6.4	3
	11	8	6	0	14	19.7	0		0	300	7.5	14
	12	7	6	0	13	18.3	0		0	306	8.2	13
	13	2	1	0	3	4.2	0		0	304	14.7	3
	14	2	5	0	7	9.9	0		0	312	8.7	7
	15	1	1	0	2	2.8	0		0	312	2.1	2
	16											
	17											
	Sample Total	35	36	0	71	100.0	0		0	298	11.4	71
26 May	2											
	3											
	4											
	5											
	6											
	7											
	8	1	2	0	3	4.1	0		0	293	7.2	3
	9	15	23	0	38	51.4	0		0	293	9.6	38
	10	1	3	0	4	5.4	0		0	300	2.8	4
	11	6	8	0	14	18.9	0		0	298	9.7	14
	12	2	2	0	4	5.4	0		0	301	12.7	4
	13	2	3	0	5	6.8	0		0	306	5.6	5
	14	4	2	0	6	8.1	0		0	312	6.8	6
	15											
	16											
	17											
	Sample Total	31	43	0	74	100.0	0		0	297	10.7	74
27 May	2											
	3											
	4											
	5											
	6											
	7	2	1	0	3	2.5	0		0	280	27.1	3
	8	2	6	0	8	6.6	0		0	286	9.5	8
	9	13	18	0	31	25.6	0		0	292	7.4	31
	10	1	9	0	10	8.3	0		0	297	5.9	10
	11	10	16	0	26	21.5	0		0	304	8.1	26
	12	9	12	0	21	17.4	0		0	303	11.7	21
	13	5	4	0	9	7.4	0		0	310	10.3	9
	14	6	7	0	13	10.7	0		0	310	9.5	13
	15											
	16											
	17											
	Sample Total	48	73	0	121	100.0	0		0	300	12.1	121

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## Appendix A.5. (p. 3 of 3)

Sample Dates	Age	Sex (number)			Percent of Total	Weight			Length		
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
28 May	2										
	3										
	4										
	5										
	6	1	1	0	2	3.1	0	0	260	8.5	2
	7	1	4	0	5	7.8	0	0	277	3.4	5
	8	1	3	0	4	6.3	0	0	287	7.0	4
	9	5	19	0	24	37.5	0	0	287	8.0	24
	10	1	2	0	3	4.7	0	0	305	2.9	3
	11	6	7	0	13	20.3	0	0	301	7.4	13
	12	2	3	0	5	7.8	0	0	306	5.7	5
	13	0	1	0	1	1.6	0	0	318		1
	14	3	4	0	7	10.9	0	0	310	9.0	7
	15										
	16										
	17										
Sample Total		20	44	0	64	100.0	0	0	294	14.0	64
All Dates Combined 22-28 May	2										
	3										
	4										
	5	1	0	0	1	0.2	0	0	294		1
	6	3	2	0	5	0.9	0	0	271	11.3	5
	7	4	11	0	15	2.7	0	0	276	11.2	15
	8	8	37	0	38	6.8	0	0	285	11.9	38
	9	74	113	0	187	33.6	0	0	291	8.8	187
	10	14	22	0	36	6.5	0	0	298	10.7	36
	11	47	54	0	101	18.1	0	0	301	9.6	101
	12	39	48	0	87	15.6	0	0	305	8.5	87
	13	15	14	0	29	5.2	0	0	309	11.3	29
	14	27	26	0	53	9.5	0	0	311	8.7	53
	15	3	2	0	5	0.9	0	0	320	13.7	5
	16										
	17										
All Samples Combined		235	322	0	557	100.0	0	0	298	13.0	557
Sex Composition		42.2	57.8								
Unaged Sex Composition		42.9	57.1	0	154	27.6	0	0	298	12.3	154

Appendix A.6. Age, sex, and size composition of herring sampled from the subsistence gillnet harvest, Nelson Island District, 3-8 June, 2002.

Sample Dates	Age	Sex (number)			Percent of Total	Weight		Length			
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
3 June	2										
	3										
	4										
	5	27	23	0	50	52.6	0	0	237	19.4	50
	6	13	10	0	23	24.2	0	0	254	6.6	23
	7	3	3	0	6	6.3	0	0	273	5.3	6
	8	2	2	0	4	4.2	0	0	278	5.1	4
	9	7	1	0	8	8.4	0	0	279	8.6	8
	10	2	0	0	2	2.1	0	0	290	23.3	2
	11	1	1	0	2	2.1	0	0	285	6.4	2
	12										
	13										
	14										
	15										
	16										
	17										
Sample Total		55	40	0	95	100.0	0	0	251	22.5	95
4 June	2										
	3										
	4										
	5	18	27	0	45	45.0	0	0	237	9.0	45
	6	12	15	0	27	27.0	0	0	252	6.6	27
	7	4	8	0	12	12.0	0	0	265	7.4	12
	8	4	3	0	7	7.0	0	0	270	5.7	7
	9	4	4	0	8	8.0	0	0	284	8.7	8
	10	1	0	0	1	1.0	0	0	285		1
	11										
	12										
	13										
	14										
	15										
	16										
	17										
Sample Total		43	57	0	100	100.0	0	0	251	17.2	100
5 June	2										
	3										
	4										
	5	21	14	0	35	38.5	0	0	242	11.2	35
	6	17	12	0	29	31.9	0	0	251	11.6	29
	7	5	1	0	6	6.6	0	0	263	9.6	6
	8	3	1	0	4	4.4	0	0	276	2.6	4
	9	7	2	0	9	9.9	0	0	275	19.7	9
	10	1	1	0	2	2.2	0	0	284	1.4	2
	11	2	1	0	3	3.3	0	0	290	9.5	3
	12	1	2	0	3	3.3	0	0	288	34.7	3
	13										
	14										
	15										
	16										
	17										
Sample Total		57	34	0	91	100.0	0	0	255	19.7	91

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## Appendix A.6. (p. 2 of 3)

Sample Dates	Age	Sex (number)			Percent of Total	Weight			Length		
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
6 June	2										
	3										
	4	1	2	0	3	6.5	0	0	224	21.0	3
	5	15	8	0	23	50.0	0	0	233	11.2	23
	6	9	3	0	12	26.1	0	0	248	16.7	12
	7	2	2	0	4	8.7	0	0	259	11.6	4
	8	1	0	0	1	2.2	0	0	274		1
	9	2	0	0	2	4.3	0	0	281	12.0	2
	10										
	11	0	1	0	1	2.2	0	0	287		1
	12										
	13										
	14										
	15										
	16										
	17										
Sample Total		30	16	0	46	100.0	0	0	243	19.8	46
7 June	2										
	3										
	4	1	0	0	1	2.0	0	0	207		1
	5	19	10	0	29	59.2	0	0	236	9.2	29
	6	7	2	0	9	18.4	0	0	257	6.9	9
	7	2	2	0	4	8.2	0	0	264	9.9	4
	8	0	2	0	2	4.1	0	0	275	7.1	2
	9	1	2	0	3	6.1	0	0	282	12.0	3
	10										
	11										
	12	1	0	0	1	2.0	0	0	315		1
	13										
	14										
	15										
	16										
	17										
Sample Total		31	18	0	49	100.0	0	0	248	20.5	49
8 June	2										
	3										
	4	0	1	0	1	2.7	0	0	214		1
	5	17	8	0	25	67.6	0	0	232	8.1	25
	6	5	6	0	11	29.7	0	0	247	13.5	11
	7										
	8										
	9										
	10										
	11										
	12										
	13										
	14										
	15										
	16										
	17										
Sample Total		22	15	0	37	100.0	0	0	236	12.4	37

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## Appendix A.6. (p. 3 of 3)

Sample Dates	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	2											
	3											
	4	2	3	0	5	1.2	0		0	219	16.8	5
	5	117	90	0	207	49.5	0		0	237	13.0	207
	6	63	48	0	111	26.6	0		0	251	10.4	111
	7	16	16	0	32	7.7	0		0	265	8.9	32
All Dates Combined	8	10	8	0	18	4.3	0		0	274	5.6	18
3-8 June	9	21	9	0	30	7.2	0		0	280	13.0	30
	10	4	1	0	5	1.2	0		0	286	12.0	5
	11	3	3	0	6	1.4	0		0	288	7.2	6
	12	2	2	0	4	1.0	0		0	295	31.5	4
	13											
	14											
	15											
	16											
	17											
All Samples Combined		238	180	0	418	100.0	0		0	249	20.0	418
Sex Composition		56.9	43.1									
Unaged		24	18	0	42	10.0	0		0	255	23.2	42
Sex Composition		57.1	42.9									

Appendix A.7. Age, sex, and size composition of herring sampled from the commercial gillnet harvest, Kokechik Bay, Cape Romanzof District, 21-28 May, 2002.

Sample Dates	Age	Sex (number)			Percent of Total	Weight			Length		
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
21 May	2										
	3										
	4										
	5										
	6										
	7										
	8	0	5	0	5	5.9	381	6.6	5	302	6.1
	9	10	13	0	23	27.1	390	47.2	22	302	9.5
	10	1	3	0	4	4.7	375	34.6	4	303	3.2
	11	4	14	0	18	21.2	417	45.6	18	309	11.8
	12	2	5	1	8	9.4	430	59.9	8	310	9.9
	13	1	8	0	9	10.6	440	42.2	9	313	11.1
	14	6	8	0	14	16.5	457	55.0	14	321	8.0
	15	2	1	0	3	3.5	448	31.4	3	330	8.6
	16										
	17	1	0	0	1	1.2	479		1	334	
	Sample Total	27	57	1	85	100.0	418	52.8	84	310	12.4
22 May	2										
	3										
	4										
	5										
	6										
	7										
	8	1	1	0	2	2.9	373	132.9	2	282	31.1
	9	4	13	0	17	25.0	380	48.8	17	287	9.9
	10	3	1	0	4	5.9	399	79.0	4	293	15.6
	11	9	15	0	24	35.3	405	47.0	24	297	12.2
	12	5	4	0	9	13.2	438	50.9	9	302	6.0
	13	0	1	0	1	1.5	377		1	288	
	14	3	5	0	8	11.8	408	26.1	8	309	5.0
	15	0	2	0	2	2.9	441	31.8	2	300	12.0
	16										
	17	0	1	0	1	1.5	451		1	314	
	Sample Total	25	43	0	68	100.0	404	51.8	68	296	12.8
23 May	2										
	3										
	4										
	5										
	6										
	7	0	1	0	1	1.4	315		1	288	
	8	1	0	0	1	1.4	313		1	281	
	9	5	13	0	18	25.4	362	39.0	18	300	9.0
	10	2	6	0	8	11.3	394	29.8	8	308	6.5
	11	6	10	1	17	23.9	387	21.2	17	306	8.1
	12	6	4	1	11	15.5	417	40.7	11	313	9.3
	13	0	3	0	3	4.2	410	41.3	3	313	1.5
	14	3	6	1	10	14.1	436	35.6	10	319	9.6
	15	1	0	0	1	1.4	454		1	326	
	16										
	17	0	1	0	1	1.4	467		1	334	
	Sample Total	24	44	3	71	100.0	394	44.1	71	308	11.4

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## Appendix A.7. (p. 2 of 3)

Sample Dates	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighted	Mean (mm)	SD	Number Measured
	2											
	3											
	4											
	5											
	6											
24 May	7	0	1	0	1	2.0	349		1	285		1
	8	0	1	0	1	2.0	369		1	282		1
	9	1	9	0	10	20.4	377	25.3	10	286	8.0	10
	10	0	1	0	1	2.0	369		1	288		1
	11	9	8	0	17	34.7	405	39.0	17	291	8.1	17
	12	1	8	0	9	18.4	430	44.5	9	301	6.9	9
	13	1	2	0	3	6.1	417	27.1	3	301	5.8	3
	14	3	3	0	6	12.2	436	53.1	6	308	10.9	6
	15	0	1	0	1	2.0	421		1	305		1
	16											
	17											
	Sample Total	15	34	0	49	100.0	406	42.6	49	294	10.7	49
	2											
	3											
	4											
	5											
	6											
25 May	7	1	0	0	1	0.8	340		1	281		1
	8											
	9	8	22	0	30	23.3	383	40.6	30	285	12.0	30
	10	0	3	0	3	2.3	404	18.1	3	295	13.6	3
	11	17	20	0	37	28.7	400	49.3	36	301	16.3	37
	12	5	11	0	16	12.4	435	40.5	16	304	13.2	16
	13	1	6	0	7	5.4	454	36.0	7	318	18.6	7
	14	9	17	0	26	20.2	448	40.5	25	308	12.9	25
	15	2	2	0	4	3.1	418	45.4	4	309	13.4	4
	16	0	2	0	2	1.6	435	28.3	2	294	4.2	2
	17	1	2	0	3	2.3	469	52.5	3	324	12.0	3
	Sample Total	44	85	0	129	100.0	415	50.1	127	301	17.0	128
	2											
	3											
	4											
	5											
27 May	6	0	1	0	1	0.9	403		1	306		1
	7											
	8											
	9	4	15	0	19	17.6	396	34.7	19	292	5.6	19
	10	0	1	0	1	0.9	365		1	292		1
	11	8	21	0	29	26.9	410	39.5	29	298	9.4	29
	12	5	10	0	15	13.9	428	31.8	15	302	9.8	15
	13	4	12	0	16	14.8	457	29.6	16	309	9.6	16
	14	9	13	0	22	20.4	434	34.1	22	306	9.5	22
	15	1	2	0	3	2.8	452	48.6	3	304	13.0	3
	16	0	2	0	2	1.9	493	9.2	2	319	25.5	2
	17											
	Sample Total	31	77	0	108	100.0	424	40.9	108	301	11.1	108

-Continued-

## Appendix A.7. (p. 3 of 3)

Sample Dates	Age	Sex (number)			Percent of Total	Weight			Length		
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	2										
	3										
	4										
	5										
	6										
28 May	7	0	1	0	1	2.2	315	1	281		1
	8										
	9	1	3	0	4	8.9	396	14.3	4	287	4.2
	10										
	11	3	10	0	13	28.9	411	25.8	13	295	9.3
	12	4	6	0	10	22.2	428	35.4	10	303	9.0
	13	1	1	0	2	4.4	415	21.9	2	311	7.8
	14	4	7	0	11	24.4	438	48.9	11	302	10.4
	15	1	3	0	4	8.9	490	21.5	4	317	6.5
	16										
	17										
	Sample Total	14	31	0	45	100.0	425	43.3	45	300	11.6
All Dates Combined	2										
21-28 May	3										
	4										
	5										
	6	0	1	0	1	0.2	403		1	306	
	7	1	3	0	4	0.7	330	17.4	4	284	3.4
	8	2	7	0	9	1.6	370	52.1	9	293	16.1
	9	33	88	0	121	21.8	383	41.0	120	292	11.4
	10	6	15	0	21	3.8	390	40.1	21	301	11.0
	11	56	98	1	155	27.9	405	41.6	154	300	12.9
	12	28	48	2	78	14.1	430	41.3	78	305	10.4
	13	8	33	0	41	7.4	442	37.4	41	311	12.1
	14	37	59	1	97	17.5	440	42.6	96	310	11.7
	15	7	11	0	18	3.2	449	39.6	18	313	13.5
	16	0	5	0	5	0.9	461	32.9	5	308	18.3
	17	2	3	0	5	0.9	470	37.4	5	328	10.2
	All Samples Combined	180	371	4	555	100.0	413	48.0	552	302	14.0
	Sex Composition	32.7	67.3								
	Unaged	85	125	1	211	38.0	411	52.5	210	304	13.5
	Sex Composition	40.5	59.5								

Appendix A.8. Age, sex, and size composition of herring sampled from the commercial gillnet harvest, St Michael Subdistrict, Norton Sound District, 24-28 May, 2002.

Sample Dates	Age	Sex (number)				Percent of Total	Weight		Length			
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighted	Mean (mm)	SD	Number Measured
24 May	2											
	3											
	4											
	5											
	6	1	5	0	6	2.2	260	53.7	6	266	14.0	6
	7	3	1	0	4	1.4	296	54.9	4	276	18.3	4
	8	15	26	4	45	16.2	337	39.2	45	288	9.1	45
	9	21	30	1	52	18.7	351	34.9	52	291	10.1	52
	10	16	24	1	41	14.7	374	32.7	41	299	10.7	41
	11	22	29	0	51	18.3	399	41.8	51	307	9.8	51
	12	16	22	3	41	14.7	400	40.7	41	305	8.6	41
	13	10	18	1	29	10.4	405	46.1	29	309	12.7	29
	14	2	4	0	6	2.2	402	35.8	6	310	7.2	6
	15	1	2	0	3	1.1	419	57.6	3	311	11.6	3
	16											
	17											
Sample Total		107	161	10	278	100.0	373	50.6	278	298	14.1	278
28 May	2											
	3											
	4											
	5	1	0	0	1	1.1	181		1	235		1
	6	2	7	0	9	9.6	240	28.2	9	256	14.3	9
	7	3	5	0	8	8.5	255	17.8	8	261	5.2	8
	8	6	9	0	15	16.0	286	20.4	15	270	4.6	15
	9	8	19	0	27	28.7	302	33.9	27	274	8.7	27
	10	7	8	0	15	16.0	378	34.5	15	285	10.1	15
	11	8	6	0	14	14.9	329	26.9	14	291	9.5	14
	12	3	0	0	3	3.2	315	17.6	3	293	6.7	3
	13											
	14	2	0	0	2	2.1	434	144.2	2	310	18.4	2
	15											
	16											
	17											
Sample Total		40	54	0	94	100.0	300	48.4	94	276	15.5	94
All Dates Combined 24-28 May	2											
	3											
	4											
	5	1	0	0	1	0.3	181		1	235		1
	6	3	12	0	15	4.0	248	39.7	15	260	14.6	15
	7	6	6	0	12	3.2	268	37.8	12	266	12.8	12
	8	21	35	4	60	16.1	324	41.8	60	283	11.3	60
	9	29	49	1	79	21.2	334	41.6	79	285	12.4	79
	10	23	32	1	56	15.1	362	38.9	56	296	12.4	56
	11	30	35	0	65	17.5	384	48.4	65	303	11.6	65
	12	19	22	3	44	11.8	394	44.9	44	304	9.0	44
	13	10	18	1	29	7.8	405	46.1	29	309	12.7	29
	14	4	4	0	8	2.2	410	64.1	8	310	9.3	8
	15	1	2	0	3	0.8	419	57.6	3	311	11.6	3
	16											
	17											
All Samples Combined Sex Composition		147	215	10	372	100.0	354	59.3	372	293	17.5	372
		40.6	59.4									
Unaged Sex Composition		9	20	2	31	8.3	356	73.6	31	292	21.3	31
		31.0	69.0									

Appendix A.9. Age, sex, and size composition of herring sampled from the commercial gillnet harvest, Cape Denbigh Subdistrict, Norton Sound District, 25-27 May, 2002.

Sample Dates	Age	Sex (number)			Percent of Total	Weight			Length		
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
25 May	2										
	3										
	4										
	5										
	6	3	1	0	4	1.5	233	23.8	4	258	7.3
	7	2	7	0	9	3.3	314	39.7	9	278	9.6
	8	11	12	0	23	8.4	341	45.0	23	289	12.7
	9	25	49	0	74	27.0	350	36.6	74	291	10.3
	10	16	26	0	42	15.3	372	38.2	42	298	9.0
	11	34	40	0	74	27.0	391	34.9	74	303	9.8
	12	14	21	0	35	12.8	401	38.6	35	307	9.2
	13	3	4	0	7	2.6	401	38.8	7	309	10.1
	14	2	2	0	4	1.5	422	35.7	4	310	6.6
	15										
	16	1	0	0	1	0.4	390		1	315	
	17	0	1	0	1	0.4	434		1	329	
Sample Total		111	163	0	274	100.0	370	47.2	274	297	13.4
27 May	2										
	3										
	4										
	5	2	3	0	5	4.5	179	23.7	5	230	11.4
	6	2	4	0	6	5.4	219	41.2	6	246	12.1
	7	1	0	0	1	0.9	240		1	260	
	8	5	3	0	8	7.1	313	31.3	8	276	9.3
	9	5	9	0	14	12.5	374	35.6	14	286	9.1
	10	5	8	0	13	11.6	369	38.7	13	284	10.1
	11	12	16	0	28	25.0	392	27.5	28	291	7.6
	12	6	8	0	14	12.5	408	30.8	14	298	7.4
	13	7	9	0	16	14.3	418	50.3	16	298	9.5
	14	2	4	0	6	5.4	411	47.6	6	298	9.3
	15	0	1	0	1	0.9	428		1	310	
	16										
	17										
Sample Total		47	65	0	112	100.0	368	72.3	112	285	19.4
All Dates Combined 25-27 May	2										
	3										
	4										
	5	2	3	0	5	1.3	179	23.7	5	230	11.4
	6	5	5	0	10	2.6	225	34.4	10	251	11.9
	7	3	7	0	10	2.6	307	44.1	10	276	10.7
	8	16	15	0	31	8.0	334	43.2	31	285	13.1
	9	30	58	0	88	22.8	354	37.3	88	290	10.2
	10	21	34	0	55	14.2	371	38.0	55	295	10.9
	11	46	56	0	102	26.4	391	32.9	102	300	10.8
	12	20	29	0	49	12.7	403	36.4	49	305	9.7
	13	10	13	0	23	6.0	413	46.9	23	301	10.6
	14	4	6	0	10	2.6	416	47.4	10	303	10.2
	15	0	1	0	1	0.3	428		1	310	
	16	1	0	0	1	0.3	390		1	315	
	17	0	1	0	1	0.3	434		1	329	
All Samples Combined Sex Composition		158	228	0	386	100.0	370	55.6	386	294	16.3
		40.9	59.1								
Unaged Sex Composition		10	17	0	27	7.0	368	53.1	27	298	12.4
		37.0	63.0								

Appendix A.10. Age, sex, and size composition of herring sampled from the commercial gillnet harvest, Norton Sound District combined, 24-28 May, 2002.

Sample Dates	Age	Sex (number)				Percent of Total	Weight		Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD
24 May	2										
	3										
	4										
	5										
	6	1	5	0	6	2.2	260	53.7	6	266	14.0
	7	3	1	0	4	1.4	296	54.9	4	276	18.3
	8	15	26	4	45	16.2	337	39.2	45	288	9.1
	9	21	30	1	52	18.7	351	34.9	52	291	10.1
	10	16	24	1	41	14.7	374	32.7	41	299	10.7
	11	22	29	0	51	18.3	399	41.8	51	307	9.8
	12	16	22	3	41	14.7	400	40.7	41	305	8.6
	13	10	18	1	29	10.4	405	46.1	29	309	12.7
	14	2	4	0	6	2.2	402	35.8	6	310	7.2
	15	1	2	0	3	1.1	419	57.6	3	311	11.6
	16										
	17										
Sample Total		107	161	10	278	100.0	373	50.6	278	298	14.1
25 May	2										
	3										
	4										
	5										
	6	3	1	0	4	1.5	233	23.8	4	258	7.3
	7	2	7	0	9	3.3	314	39.7	9	278	9.6
	8	11	12	0	23	8.4	341	45.0	23	289	12.7
	9	25	49	0	74	27.0	350	36.6	74	291	10.3
	10	16	26	0	42	15.3	372	38.2	42	298	9.0
	11	34	40	0	74	27.0	391	34.9	74	303	9.8
	12	14	21	0	35	12.8	401	38.6	35	307	9.2
	13	3	4	0	7	2.6	401	38.8	7	309	10.1
	14	2	2	0	4	1.5	422	35.7	4	310	6.6
	15										
	16	1	0	0	1	0.4	390		1	315	
	17	0	1	0	1	0.4	434		1	329	
Sample Total		111	163	0	274	100.0	370	47.2	274	297	13.4
27 May	2										
	3										
	4										
	5	2	3	0	5	4.5	179	23.7	5	230	11.4
	6	2	4	0	6	5.4	219	41.2	6	246	12.1
	7	1	0	0	1	0.9	240		1	260	
	8	5	3	0	8	7.1	313	31.3	8	276	9.3
	9	5	9	0	14	12.5	374	35.6	14	286	9.1
	10	5	8	0	13	11.6	369	38.7	13	284	10.1
	11	12	16	0	28	25.0	392	27.5	28	291	7.6
	12	6	8	0	14	12.5	408	30.8	14	298	7.4
	13	7	9	0	16	14.3	418	50.3	16	298	9.5
	14	2	4	0	6	5.4	411	47.6	6	298	9.3
	15	0	1	0	1	0.9	428		1	310	
	16										
	17										
Sample Total		47	65	0	112	100.0	368	72.3	112	285	19.4

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## Appendix A.10. (p. 2 of 2)

Sample Dates	Age	Sex (number)			Percent of Total	Weight			Length			
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured	
28 May	1											
	2											
	3											
	4											
	5	1	0	0	1	1.1	181		235		1	
	6	2	7	0	9	9.6	240	28.2	256	14.3	9	
	7	3	5	0	8	8.5	255	17.8	261	5.2	8	
	8	6	9	0	15	16.0	286	20.4	270	4.6	15	
	9	8	19	0	27	28.7	302	33.9	274	8.7	27	
	10	7	8	0	15	16.0	328	34.5	285	10.1	15	
	11	8	6	0	14	14.9	329	26.9	291	9.5	14	
	12	3	0	0	3	3.2	315	17.6	293	6.7	3	
	13											
	14	2	0	0	2	2.1	434	144.2	310	18.4	2	
	15											
	16											
	17											
Sample Total		40	54	0	94	100.0	300	48.4	94	276	15.5	94
All Dates Combined 24-28 May	1											
	2											
	3											
	4											
	5	3	3	0	6	0.8	179	21.2	231	10.4	6	
	6	8	17	0	25	3.3	239	38.7	256	14.1	25	
	7	9	13	0	22	2.9	286	44.3	271	12.8	22	
	8	37	50	4	91	12.0	328	42.3	284	11.9	91	
	9	59	107	1	167	22.0	345	40.5	288	11.6	167	
	10	44	66	1	111	14.6	366	38.6	295	11.6	111	
	11	76	91	0	167	22.0	388	39.7	301	11.3	167	
	12	39	51	3	93	12.3	399	40.6	304	9.3	93	
	13	20	31	1	52	6.9	409	46.2	306	12.4	52	
	14	8	10	0	18	2.4	413	51.1	306	10.2	18	
	15	1	3	0	4	0.5	421	47.2	311	9.5	4	
	16	1	0	0	1	0.1	390		315		1	
	17	0	1	0	1	0.1	434		329		1	
All Samples Combined		305	443	10	758	100.0	362	57.9	758	293	16.9	758
Sex Composition		40.8	59.2									
Unaged Sex Composition		19	37	2	58	7.7	362	64.6	58	295	17.9	58
		33.9	66.1									

Appendix A.11. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catch, Security Cove District, 13-26 May, 2002.

Sample Weeks	Age	Sex (number)			Percent of Total	Weight			Length		
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
13-19 May	2										
	3										
	4	1	1	0	2	0.6	126	8.5	2	216	12.7
	5	109	65	0	174	48.5	190	29.4	174	239	9.6
	6	57	51	0	108	30.1	239	34.9	108	257	11.7
	7	6	8	0	14	3.9	282	40.9	14	270	8.4
	8	1	4	0	5	1.4	333	40.5	5	279	9.8
	9	13	11	0	24	6.7	347	52.0	24	291	9.4
	10	4	4	0	8	2.2	379	30.8	8	294	5.4
	11	11	4	0	15	4.2	378	30.3	15	299	9.0
	12	4	1	0	5	1.4	419	71.4	5	302	10.5
	13	0	3	0	3	0.8	425	25.2	3	310	0.6
	14										
	15	0	1	0	1	0.3	575		1	342	
	16										
	17										
Sample Total		206	153	0	359	100.0	239	75.1	359	255	22.9
<hr/>											
20-26 May	2										
	3										
	4	10	3	0	13	3.6	132	10.8	13	208	25.9
	5	144	108	0	252	69.6	185	29.0	252	235	10.6
	6	38	39	0	77	21.3	230	36.6	77	252	10.8
	7	1	6	0	7	1.9	266	40.8	7	268	10.3
	8	3	2	0	5	1.4	282	21.1	5	276	3.8
	9	2	1	0	3	0.8	336	38.8	3	292	1.7
	10										
	11	1	1	0	2	0.6	235	176.1	2	296	0.7
	12										
	13										
	14	2	1	0	3	0.8	418	33.4	3	302	7.0
	15										
	16										
	17										
Sample Total		201	161	0	362	100.0	199	47.4	362	240	17.8
<hr/>											
All Weeks Combined 13-26 May	2										
	3										
	4	11	4	0	15	2.1	132	10.5	15	209	24.4
	5	253	173	0	426	59.1	187	29.2	426	237	10.4
	6	95	90	0	185	25.7	235	35.8	185	255	11.5
	7	7	14	0	21	2.9	276	40.6	21	270	8.8
	8	4	6	0	10	1.4	307	40.7	10	278	7.3
	9	15	12	0	27	3.7	346	50.2	27	291	8.9
	10	4	4	0	8	1.1	379	30.8	8	294	5.4
	11	12	5	0	17	2.4	361	70.8	17	299	8.5
	12	4	1	0	5	0.7	419	71.4	5	302	10.5
	13	0	3	0	5	0.4	425	25.2	3	310	0.6
	14	2	1	0	3	0.4	418	33.4	3	302	7.0
	15	0	1	0	1	0.1	575		1	342	
	16										
	17										
All Samples Combined Sex Composition		407	314	0	721	100.0	219	65.8	721	248	21.8
<hr/>											
Unaged Sex Composition		64	49	0	113	15.7	241	73.8	113	257	25.9
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Appendix A.12. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catch, Goodnews Bay District, 6-26 May, 2002.

Sample Weeks	Age	Sex (number)			Percent of Total	Weight		Length			
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
6-12 May	2										
	3										
	4	2	1	0	3	0.9	147	24.7	3	238	15.1
	5	40	41	0	81	23.2	191	28.4	81	258	13.4
	6	35	37	0	72	20.6	241	38.1	72	275	11.7
	7	8	10	0	18	5.2	275	39.0	18	281	11.9
	8	4	4	0	8	2.3	326	69.4	8	290	19.9
	9	22	26	0	48	13.8	364	76.7	48	301	18.1
	10	7	8	0	15	4.3	420	64.6	15	314	18.5
	11	21	21	0	42	12.0	399	56.1	42	306	17.4
	12	6	9	0	15	4.3	451	50.9	15	317	17.3
	13	5	4	0	9	2.6	434	49.2	9	325	11.1
	14	17	13	0	30	8.6	451	76.0	30	325	25.9
	15	1	6	0	7	2.0	435	105.2	7	319	13.4
	16	0	1	0	1	0.3	536		1	335	
	17										
Sample Total		168	181	0	349	100.0	313	112.7	349	289	28.7
13-19 May	2										
	3										
	4	5	1	0	6	1.7	140	9.0	6	216	8.8
	5	122	75	0	197	54.4	182	26.0	197	237	10.8
	6	55	41	0	96	26.5	217	37.6	96	252	11.0
	7	10	7	0	17	4.7	239	37.7	17	258	14.0
	8	2	2	0	4	1.1	324	87.9	4	274	12.0
	9	13	11	0	24	6.6	332	47.5	24	286	9.0
	10										
	11	5	7	0	12	3.3	389	88.1	12	297	10.1
	12	2	1	0	3	0.8	456	121.3	3	304	17.8
	13	1	0	0	1	0.3	360		1	304	
	14	0	1	0	1	0.3	408		1	300	
	15										
	16	0	1	0	1	0.3	435		1	323	
	17										
Sample Total		215	147	0	362	100.0	216	69.7	362	248	21.1
20-26 May	2										
	3										
	4	11	12	0	23	6.0	125	14.8	23	212	8.8
	5	111	112	0	223	58.2	174	28.6	223	237	9.5
	6	34	36	0	70	18.3	217	35.0	70	254	10.1
	7	4	6	0	10	2.6	282	43.3	10	273	13.4
	8	4	1	0	5	1.3	310	37.6	5	283	13.8
	9	9	16	0	25	6.5	337	58.2	25	289	9.2
	10	2	3	0	5	1.3	370	53.1	5	296	8.0
	11	6	6	0	12	3.1	415	38.6	12	305	7.8
	12	2	2	0	4	1.0	441	64.0	4	304	14.6
	13	0	2	0	2	0.5	538	42.4	2	318	11.3
	14	1	2	0	3	0.8	434	38.6	3	306	2.0
	15										
	16										
	17	0	1	0	1	0.3	430		1	317	
Sample Total		184	192	0	383	100.0	212	83.0	383	249	24.7

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## Appendix A.12. (p. 2 of 2)

Sample Weeks	Age	Sex (number)				Percent of Total	Weight		Length		
							Mean (g)	SD	Number Weighed	Mean (mm)	SD
		Male	Female	Unknown	Total						
	2										
	3										
	4	18	14	0	32	2.9	130	16.4	32	215	11.7
	5	273	228	0	501	45.8	180	28.2	501	241	13.2
	6	124	114	0	238	21.8	224	38.5	238	259	15.1
	7	22	23	0	45	4.1	263	43.0	45	270	16.4
All Weeks Combined	8	10	7	0	17	1.6	320	62.9	17	284	17.0
6-26 May	9	44	53	0	97	8.9	349	67.0	97	294	15.7
	10	9	11	0	20	1.8	407	64.5	20	309	18.1
	11	32	34	0	66	6.0	400	60.1	66	305	15.2
	12	10	12	0	22	2.0	450	61.1	22	313	17.2
	13	6	6	0	12	1.1	446	65.1	12	322	11.9
	14	18	16	0	34	3.1	448	72.4	34	323	25.3
	15	1	6	0	7	0.6	435	105.2	7	319	13.4
	16	0	2	0	2	0.2	486	71.4	2	329	8.5
	17	0	1	0	1	0.1	430		1	317	
All Samples Combined		567	527	0	1094	100.0	245	100.9	1094	261	31.3
Sex Composition		51.8	48.2								
Unaged		103	72	0	175	16.0	290	93.4	175	276	30.5
Sex Composition		58.9	41.1								

Appendix A.13. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catch,  
Cape Avinof District, 20 May - 9 June, 2002.

Sample Weeks	Age	Sex (number)			Percent of Total	Weight			Length		
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
20-26 May	2										
	3	0	1	0	1	1.0	49	1	168	4.2	1
	4	2	1	0	3	3.1	122	16.8	3	208	8.3
	5	32	32	0	64	65.3	164	23.6	64	229	6.3
	6	7	6	0	13	13.3	207	20.9	13	249	6.3
	7	1	3	0	4	4.1	260	17.8	4	260	7.9
	8	0	2	0	2	2.0	316	29.0	2	282	2.8
	9	4	2	0	6	6.1	312	24.9	6	275	5.5
	10	1	2	0	3	3.1	340	48.3	3	282	12.9
	11	1	1	0	2	2.0	395	9.9	2	291	1.4
	12										
	13										
	14										
	15										
	16										
	17										
Sample Total		48	50	0	98	100.0	194	65.9	98	238	21.5
27 May - 2 June	2	0	1	0	1	0.2	58	1	172	3.3	1
	3	4	1	0	5	1.1	82	6.8	5	187	5
	4	13	9	0	22	4.9	128	17.6	22	218	9.0
	5	159	117	0	276	60.9	167	24.0	276	234	9.5
	6	40	53	0	93	20.5	209	35.4	93	253	12.6
	7	3	10	0	13	2.9	245	30.7	13	261	9.2
	8	4	4	0	8	1.8	297	39.3	8	277	8.1
	9	7	11	0	18	4.0	290	55.0	18	275	14.8
	10	1	4	0	5	1.1	385	46.4	5	292	12.9
	11	3	1	0	4	0.9	355	36.4	4	293	6.0
	12	2	2	0	4	0.9	394	41.8	4	310	6.0
	13	1	0	0	1	0.2	458	1	304		1
	14	1	0	0	1	0.2	443	1	317		1
	15	0	1	0	1	0.2	478	1	304		1
	16	0	1	0	1	0.2	518	1	315		1
	17										
Sample Total		238	215	0	453	100.0	191	63.3	453	242	21.1
3-9 June	2										
	3	5	3	0	8	2.1	102	15.0	8	202	9.8
	4	15	13	0	28	7.4	123	16.8	28	214	9.2
	5	119	112	0	231	61.4	161	23.3	231	235	9.8
	6	23	38	0	61	16.2	212	34.8	61	254	9.7
	7	7	7	0	14	3.7	248	33.1	14	269	9.9
	8	1	8	0	9	2.4	288	64.7	9	274	17.9
	9	5	7	0	12	3.2	330	59.3	12	289	10.7
	10	1	3	0	4	1.1	336	37.8	4	291	7.2
	11	1	0	0	1	0.3	258	1	301		1
	12	0	3	0	3	0.8	417	44.7	3	308	1.0
	13	1	0	0	1	0.3	371	1	304		1
	14	1	3	0	4	1.1	417	85.3	4	315	11.9
	15										
	16										
	17										
Sample Total		179	197	0	376	100.0	184	64.7	376	242	22.3

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Appendix A.13. (p. 2 of 2)

Sample Weeks	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	2	0	1	0	1	0.1	58		1	172		1
	3	9	5	0	14	1.5	91	19.6	14	194	13.0	14
	4	30	23	0	53	5.7	125	17.0	53	215	9.1	53
	5	310	261	0	571	61.6	164	23.8	571	234	9.7	571
	6	70	97	0	167	18.0	210	34.2	167	253	11.2	167
	7	11	20	0	31	3.3	248	30.1	31	264	10.0	31
All Weeks Combined	8	5	14	0	19	2.0	295	50.8	19	276	13.2	19
20 May - 9 June	9	16	20	0	36	3.9	307	54.7	36	280	13.9	36
	10	3	9	0	12	1.3	357	46.9	12	289	11.2	12
	11	5	2	0	7	0.8	353	52.7	7	293	5.5	7
	12	2	5	0	7	0.8	404	41.1	7	309	4.5	7
	13	2	0	0	2	0.2	415	61.5	2	304	0.0	2
	14	2	3	0	5	0.5	422	74.8	5	315	10.4	5
	15	0	1	0	1	0.1	478		1	304		1
	16	0	1	0	1	0.1	518		1	315		1
	17											
All Samples Combined		465	462	0	927	100.0	189	64.2	927	242	21.6	927
Sex Composition		50.2	49.8									
Unaged		62	84	0	146	15.7	212	75.5	146	250	27.3	146
Sex Composition		42.5	57.5									

Appendix A.14. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catch, Nelson Island District, 20 May - 9 June, 2002.

Sample Weeks	Age	Sex (number)			Percent of Total	Weight			Length			
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured	
	2											
	3											
20-26 May	4	4	10	0	14	3.7	140	36.3	14	216	9.2	14
	5	86	74	0	160	42.3	187	33.1	160	239	10.0	160
	6	35	57	0	92	24.3	234	39.3	92	257	10.5	92
	7	4	8	0	12	3.2	261	36.2	12	264	8.0	12
	8	6	4	0	10	2.6	284	31.5	10	276	7.4	10
	9	31	19	0	50	13.2	320	49.7	50	285	8.5	50
	10	5	6	0	11	2.9	353	49.1	11	294	9.0	11
	11	9	8	0	17	4.5	344	53.9	17	293	10.9	17
	12	4	3	0	7	1.9	364	29.6	7	297	11.0	7
	13	1	2	0	3	0.8	425	103.7	3	310	17.0	3
	14	1	1	0	2	0.5	468	84.9	2	314	10.6	2
	15											
	16											
	17											
Sample Total		186	192	0	378	100.0	238	75.6	378	256	23.8	378
27 May - 2 June	2											
	3	0	2	0	2	0.5	102	5.7	2	201	5.7	2
	4	12	8	0	20	5.5	123	12.6	20	213	8.0	20
	5	84	65	0	149	40.7	178	30.6	149	236	9.4	149
	6	29	32	0	61	16.7	230	29.9	61	255	10.1	61
	7	11	4	0	15	4.1	257	34.2	15	269	7.5	15
	8	3	11	0	14	3.8	290	30.8	14	281	7.8	14
	9	22	36	0	58	15.8	318	60.6	58	284	10.8	58
	10	10	4	0	14	3.8	328	64.9	14	294	13.9	14
	11	8	16	0	24	6.6	365	78.6	24	297	14.2	24
	12	3	1	0	4	1.1	413	41.8	4	309	5.7	4
	13	1	0	0	1	0.3	404		1	315		1
	14	1	0	0	1	0.3	444		1	313		1
	15	2	0	0	2	0.5	394	70.7	2	315	17.0	2
	16											
	17	1	0	0	1	0.3	382		1	315		1
Sample Total		187	179	0	366	100.0	236	85.4	366	257	27.8	366
3-9 June	2											
	3	2	2	0	4	1.1	107	27.8	4	178	68.1	4
	4	6	9	0	15	4.2	123	13.5	15	212	6.0	15
	5	70	92	0	162	45.1	170	28.2	162	234	11.8	162
	6	31	33	0	64	17.8	219	35.6	64	253	15.8	64
	7	6	5	0	11	3.1	239	34.0	11	263	8.9	11
	8	13	16	0	29	8.1	271	48.4	29	275	11.0	29
	9	15	24	0	39	10.9	291	49.8	39	281	11.7	39
	10	7	3	0	10	2.8	309	51.3	10	288	10.2	10
	11	6	8	0	14	3.9	326	58.3	14	290	10.5	14
	12	3	4	0	7	1.9	361	102.0	7	303	10.8	7
	13	1	0	0	1	0.3	348		1	309		1
	14	2	1	0	3	0.8	389	28.0	3	302	12.1	3
	15											
	16											
	17											
Sample Total		162	197	0	359	100.0	215	72.1	359	251	27.7	359

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Appendix A.14. (p. 2 of 2)

Sample Weeks	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	2											
	3	2	4	0	6	0.5	105	21.8	6	186	54.1	6
	4	22	27	0	49	4.4	128	23.0	49	214	7.8	49
	5	240	231	0	471	42.7	178	31.5	471	237	10.7	471
	6	95	122	0	217	19.7	228	36.2	217	255	12.3	217
	7	21	17	0	38	3.4	253	35.0	38	265	8.3	38
All Weeks Combined	8	22	31	0	53	4.8	279	41.7	53	277	9.7	53
20 May - 9 June	9	68	79	0	147	13.3	312	55.4	147	284	10.4	147
	10	22	13	0	35	3.2	330	57.6	35	292	11.5	35
	11	23	32	0	55	5.0	349	67.6	55	294	12.4	55
	12	10	8	0	18	1.6	374	68.9	18	302	10.6	18
	13	3	2	0	5	0.5	406	80.6	5	311	12.3	5
	14	4	2	0	6	0.5	424	57.9	6	308	10.9	6
	15	2	0	0	2	0.2	394	70.7	2	315	17.0	2
	16											
	17	1	0	0	1	0.1	382		1	315		1
All Samples Combined		535	568	0	1103	100.0	230	78.5	1103	255	26.5	1103
Sex Composition		48.5	51.5									
Unaged		87	95	0	182	16.5	270	88.1	182	269	27.5	182
Sex Composition		47.8	52.2									

Appendix A.15. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catch, Cape Romanzof District, 13 May - 9 June, 2002.

Sample Weeks	Age	Sex (number)			Percent of Total	Weight			Length			
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured	
13-19 May	2											
	3											
	4											
	5	21	9	0	30	33.0	17.0	30	241	7.3	30	
	6	12	8	1	21	23.1	26.6	21	256	12.1	21	
	7	3	1	0	4	4.4	21.9	4	264	7.3	4	
	8	1	0	0	1	1.1	327	1	292		1	
	9	12	6	0	18	19.8	44.7	18	283	14.3	18	
	10											
	11	6	2	0	8	8.8	34.9	8	293	12.3	8	
	12	3	1	0	4	4.4	32.1	4	299	5.6	4	
	13											
	14	3	2	0	5	5.5	49.9	5	300	10.2	5	
	15											
	16											
	17											
Sample Total		61	29	1	91	100.0	269	87.1	91	265	24.0	91
20-26 May	2											
	3											
	4	3	4	0	7	1.4	137	18.4	7	226	9.1	7
	5	139	73	0	212	43.0	178	25.9	211	236	11.3	212
	6	72	41	0	113	22.9	217	31.1	111	251	13.4	113
	7	20	15	0	35	7.1	234	31.3	35	255	14.6	35
	8	2	3	0	5	1.0	284	73.2	5	267	18.7	5
	9	37	24	0	61	12.4	294	35.3	60	280	13.2	61
	10	5	1	0	6	1.2	291	55.6	6	279	15.5	6
	11	17	16	0	33	6.7	353	60.4	32	295	16.9	33
	12	5	3	0	8	1.6	396	83.1	7	300	15.2	8
	13	0	1	0	1	0.2	464		1	318		1
	14	7	4	0	11	2.2	389	44.3	11	303	13.1	11
	15	1	0	0	1	0.2	513		1	297		1
	16											
	17											
Sample Total		308	185	0	493	100.0	228	72.9	487	254	25.0	493
27 May - 2 June	2											
	3											
	4	6	8	0	14	4.0	125	13.2	14	215	7.9	14
	5	80	68	0	148	42.5	175	27.2	146	233	11.8	148
	6	48	40	0	88	25.3	214	32.3	87	247	11.1	88
	7	8	9	0	17	4.9	236	27.8	17	258	9.4	17
	8	4	5	0	9	2.6	288	52.1	9	268	11.0	9
	9	19	13	0	32	9.2	314	47.2	32	275	11.0	32
	10											
	11	19	7	0	26	7.5	330	46.3	25	285	8.5	26
	12	0	4	0	4	1.1	422	35.1	4	298	10.6	4
	13	2	1	0	3	0.9	423	52.6	3	303	7.8	3
	14	3	3	0	6	1.7	399	54.6	6	293	7.7	6
	15	1	0	0	1	0.3	349		1	295		1
	16											
	17											
Sample Total		190	158	0	348	100.0	222	75.2	344	248	23.3	348

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Appendix A.15. (p. 2 of 2)

Sample Weeks	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
3-9 June	2											
	3											
	4	8	3	0	11	4.5	120	7.4	11	206	8.2	11
	5	42	36	0	78	32.2	146	20.7	78	225	10.4	78
	6	6	12	0	18	7.4	192	41.3	18	240	14.4	18
	7	7	8	0	15	6.2	230	29.1	15	260	12.1	15
	8	0	1	0	1	0.4	270		1	287		1
	9	30	25	0	55	22.7	293	38.0	55	282	12.4	55
	10	3	4	0	7	2.9	301	38.3	7	281	13.5	7
	11	19	14	0	33	13.6	306	31.4	33	288	9.9	33
	12	5	6	0	11	4.5	340	55.8	11	297	8.8	11
	13	0	3	0	3	1.2	333	35.7	3	302	4.0	3
	14	7	2	0	9	3.7	336	43.2	9	300	9.4	9
	15	0	1	0	1	0.4	450		1	314		1
	16											
	17											
Sample Total		127	115	0	242	100.0	233	84.2	242	258	32.6	242
All Weeks Combined 13 May - 9 June	2											
	3											
	4	17	15	0	32	2.7	126	14.1	32	214	10.9	32
	5	282	186	0	468	39.9	172	27.7	465	234	11.9	468
	6	138	101	1	240	20.4	215	33.0	237	249	13.0	240
	7	38	33	0	71	6.0	234	29.3	71	258	12.7	71
	8	7	9	0	16	1.4	288	54.8	16	270	14.7	16
	9	98	68	0	166	14.1	302	41.6	165	280	12.8	166
	10	8	5	0	13	1.1	296	45.2	13	280	13.9	13
	11	61	39	0	100	8.5	334	51.5	98	290	13.1	100
	12	13	14	0	27	2.3	380	67.2	26	298	10.5	27
	13	2	5	0	7	0.6	390	66.5	7	305	7.8	7
	14	20	11	0	31	2.6	379	52.7	31	300	10.8	31
	15	2	1	0	3	0.3	437	82.7	3	302	10.4	3
	16											
	17											
All Samples Combined Sex Composition		686	487	1	1174	100.0	231	78.0	1164	254	26.6	1174
Unaged Sex Composition		58.5	41.5									
		125	78	1	204	17.4	258	87.9	204	264	27.5	204
		61.6	38.4									

Appendix A.16 Age, sex, and size composition of herring sampled from the variable-mesh gillnet catch,  
St Michael Subdistrict, Norton Sound District, 20 May - 9 June, 2002.

Sample Weeks	Age	Sex (number)			Percent of Total	Weight			Length		
		Male	Female	Unknown		Mean (g)	SD	Number Weighted	Mean (mm)	SD	Number Measured
20-26 May	2										
	3										
	4	2	1	0	3	0.5	173	45.6	3	225	17.0
	5	80	67	1	148	26.5	184	24.4	147	236	10.7
	6	144	82	3	229	41.0	217	30.4	229	253	13.1
	7	23	19	0	42	7.5	242	42.4	42	258	16.0
	8	27	13	0	40	7.2	289	56.1	40	275	15.4
	9	18	10	2	30	5.4	303	53.8	30	280	11.4
	10	16	15	0	31	5.6	350	58.7	31	292	15.4
	11	8	7	0	15	2.7	382	57.5	15	300	11.3
	12	3	3	0	6	1.1	415	61.8	6	305	11.6
	13	4	6	0	10	1.8	415	50.9	10	308	9.6
	14	2	2	0	4	0.7	462	35.0	4	312	12.1
	15										
	16										
	17										
Sample Total		327	225	6	558	100.0	239	72.9	557	257	23.6
<hr/>											
27 May - 2 June	2										
	3										
	4	9	9	0	18	4.5	125	10.7	18	210	7.7
	5	107	93	0	200	50.1	164	25.1	200	226	9.7
	6	66	30	0	96	24.1	203	34.5	96	244	12.1
	7	18	11	0	29	7.3	234	36.2	29	254	14.6
	8	9	2	0	11	2.8	254	49.1	11	267	17.8
	9	11	12	0	23	5.8	329	50.2	23	282	12.2
	10	5	5	0	10	2.5	342	51.0	10	286	12.8
	11	3	2	0	5	1.3	349	46.1	5	294	15.4
	12	2	2	0	4	1.0	382	39.7	4	293	5.9
	13	2	0	0	2	0.5	362	34.6	2	297	2.8
	14	0	1	0	1	0.3	567		1	312	1
	15										
	16										
	17										
Sample Total		232	167	0	399	100.0	200	67.9	399	239	23.4
<hr/>											
3-9 June	2										
	3										
	4	4	1	0	5	8.8	126	37.0	5	210	14.4
	5	16	16	0	32	56.1	164	22.1	32	227	9.1
	6	9	6	0	15	26.3	192	27.4	15	237	11.1
	7	1	1	0	2	3.5	216	94.0	2	245	26.2
	8	0	1	0	1	1.8	346		1	282	1
	9										
	10										
	11	1	0	0	1	1.8	330		1	285	1
	12										
	13	0	1	0	1	1.8	431		1	314	1
	14										
	15										
	16										
	17										
Sample Total		31	26	0	57	100.0	180	56.8	57	232	19.7
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## Appendix A.16. (p. 2 of 2)

Sample Weeks	Age	Sex (number)			Percent of Total	Weight		Length		
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD
2										
3										
4	15	11	0	26	2.6	131	26.5	26	212	11.0
5	203	176	1	380	37.5	172	26.4	379	230	11.1
6	219	118	3	340	33.5	212	32.3	340	249	13.5
7	42	31	0	73	7.2	238	41.1	73	256	15.7
All Weeks Combined	8	36	16	0	5.1	283	56.3	52	273	16.0
20 May - 9 June	9	29	22	2	5.2	314	53.3	53	281	11.7
	10	21	20	0	4.0	348	56.4	41	291	14.9
	11	12	9	0	2.1	372	54.1	21	298	12.3
	12	5	5	0	1.0	402	54.1	10	300	11.1
	13	6	7	0	1.3	408	49.9	13	307	9.5
	14	2	3	0	0.5	483	55.8	5	312	10.5
	15									
	16									
	17									
All Samples Combined		590	418	6	1014	100.0	220	73.2	1013	249
Sex Composition		58.5	41.5							25.1
Unaged		34	22	0	56	5.5	245	82.2	56	258
Sex Composition		60.7	39.3							29.9
										56

Appendix A.17. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catch, Unalakleet Subdistrict, Norton Sound District, 20 May - 2 June, 2002.

Sample Weeks	Age	Sex (number)			Percent of Total	Weight			Length		
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
20-26 May	2										
	3	1	0	0	1	0.2	120	1	208		1
	4	1	0	0	1	0.2	129	1	224		1
	5	65	47	3	115	28.2	183	23.2	115	240	9.1
	6	68	58	3	129	31.6	223	32.2	129	257	10.6
	7	16	14	0	30	7.4	269	42.1	30	270	11.6
	8	15	12	0	27	6.6	299	44.5	27	277	11.7
	9	20	20	1	41	10.0	319	79.1	41	285	16.4
	10	12	13	0	25	6.1	343	40.3	25	291	12.3
	11	13	9	0	22	5.4	370	48.4	22	300	11.4
	12	8	4	1	13	3.2	389	37.4	12	306	11.0
	13	3	1	0	4	1.0	403	67.9	4	312	13.4
	14										
	15										
	16										
	17										
Sample Total		222	178	8	408	100.0	251	77.4	407	264	23.8
27 May - 2 June	2										
	3	0	3	0	3	1.0	90	18.2	3	194	7.8
	4	2	1	0	3	1.0	141	12.7	3	219	1.0
	5	80	69	0	149	50.3	162	20.7	149	236	8.9
	6	37	38	0	75	25.3	186	27.9	75	250	12.1
	7	4	9	0	13	4.4	231	19.7	13	267	9.2
	8	12	8	0	20	6.8	269	23.3	20	279	7.9
	9	6	7	0	13	4.4	298	23.8	13	288	8.4
	10	5	2	0	7	2.4	303	31.6	7	286	8.7
	11	6	4	0	10	3.4	327	30.6	10	299	9.4
	12										
	13	1	2	0	3	1.0	393	32.0	3	319	3.1
	14										
	15										
	16										
	17										
Sample Total		153	143	0	296	100.0	195	58.4	296	250	22.8
All Weeks Combined	2										
	3	↑	3	0	4	0.6	98	21.1	4	198	9.5
	4	3	1	0	4	0.6	138	12.1	4	220	2.6
	5	145	116	3	264	37.5	171	24.1	264	238	9.1
	6	105	96	3	204	29.0	209	35.4	204	254	11.6
	7	20	23	0	43	6.1	258	40.5	43	269	10.9
	8	27	20	0	47	6.7	286	39.6	47	278	10.2
	9	26	27	1	54	7.7	314	70.3	54	286	14.9
	10	17	15	0	32	4.5	334	41.5	32	290	11.7
	11	19	13	0	32	4.5	357	47.8	32	300	10.7
	12	8	4	1	13	1.8	389	37.4	12	306	11.0
	13	4	3	0	7	1.0	399	51.7	7	315	10.4
	14										
	15										
	16										
	17										
All Samples Combined		375	321	8	704	100.0	227	75.4	703	258	24.3
Sex Composition		53.9	46.1								
Unaged		9	7	0	16	2.3	272	88.6	16	282	34.6
Sex Composition		56.3	43.8								

Appendix A.18. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catch,  
Cape Denbigh Subdistrict, Norton Sound District, 20 May - 9 June, 2002.

Sample Weeks	Age	Sex (number)			Percent of Total	Weight		Length			
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
20-26 May	2										
	3										
	4	7	2	0	9	2.1	127	8.5	9	213	6.8
	5	107	66	0	173	41.3	166	22.7	173	227	8.3
	6	67	63	0	130	31.0	207	32.6	130	243	10.1
	7	6	8	0	14	3.3	239	50.6	14	252	15.5
	8	9	12	0	21	5.0	302	47.5	21	272	10.7
	9	16	18	0	34	8.1	317	39.3	34	273	10.5
	10	5	5	0	10	2.4	333	54.3	10	281	10.6
	11	8	6	0	14	3.3	364	40.7	14	286	7.5
	12	4	2	0	6	1.4	375	47.7	6	293	9.4
	13	3	4	0	7	1.7	407	35.6	7	301	7.4
	14	1	0	0	1	0.2	374		1	300	
	15										
	16										
	17										
Sample Total		233	186	0	419	100.0	217	74.6	419	244	22.8
27 May - 2 June	2										
	3										
	4	23	16	0	39	8.5	126	16.7	39	212	8.3
	5	150	112	0	262	57.0	153	21.6	262	223	7.9
	6	30	32	0	62	13.5	181	34.2	62	234	10.7
	7	11	8	0	19	4.1	225	44.4	19	250	13.9
	8	2	7	0	9	2.0	288	30.4	9	272	8.7
	9	10	15	0	25	5.4	294	41.3	25	274	13.3
	10	3	8	0	11	2.4	301	41.9	11	281	12.7
	11	7	10	0	17	3.7	347	27.7	17	294	10.1
	12	2	5	0	7	1.5	387	43.1	7	299	7.7
	13	5	2	0	7	1.5	370	42.4	7	294	8.3
	14	1	0	0	1	0.2	368		1	297	
	15	0	1	0	1	0.2	448		1	305	
	16										
	17										
Sample Total		244	216	0	460	100.0	186	72.2	460	235	25.3
3-9 June	2										
	3										
	4	4	2	0	6	10.0	122	8.2	6	212	5.0
	5	25	21	0	46	76.7	147	19.0	46	222	8.0
	6	4	2	0	6	10.0	178	15.5	6	236	5.7
	7	1	0	0	1	1.7	160		1	236	
	8	1	0	0	1	1.7	254		1	260	
	9										
	10										
	11										
	12										
	13										
	14										
	15										
	16										
	17										
Sample Total		35	25	0	60	100.0	150	25.6	60	224	10.4

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Appendix A.18. (p. 2 of 2)

Sample Weeks	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	2											
	3											
	4	34	20	0	54	5.8	125	14.8	54	212	7.7	54
	5	282	199	0	481	51.2	157	22.8	481	225	8.3	481
	6	101	97	0	198	21.1	198	35.0	198	240	10.9	198
	7	18	16	0	34	3.6	229	47.8	34	250	14.4	34
All Weeks Combined	8	12	19	0	31	3.3	296	43.1	31	272	10.1	31
20 May - 9 June	9	26	33	0	59	6.3	307	41.3	59	273	11.7	59
	10	8	13	0	21	2.2	316	49.7	21	281	11.5	21
	11	15	16	0	31	3.3	355	34.6	31	290	9.8	31
	12	6	7	0	13	1.4	381	43.8	13	296	8.9	13
	13	8	6	0	14	1.5	389	42.3	14	298	8.4	14
	14	2	0	0	2	0.2	371	4.2	2	299	2.1	2
	15	0	1	0	1	0.1	448		1	305		1
	16											
	17											
All Samples Combined		512	427	0	939	100.0	198	73.8	939	238	24.2	939
Sex Composition		54.5	45.5									
Unaged		1	0	0	1	0.1	244		1	251		1
Sex Composition		100.0	0.0									

Appendix A.19. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catch, Norton Sound District combined, 20 May - 9 June, 2002.

Sample Weeks	Age	Sex (number)				Percent of Total	Weight		Length			
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
20-26 May	2											
	3	1	0	0	1	0.1	120		1	208	1	
	4	10	3	0	13	0.9	138	28.2	13	217	10.6	
	5	252	180	4	436	31.5	176	25.0	435	234	10.8	
	6	279	203	6	488	35.2	216	32.0	488	251	12.9	
	7	45	41	0	86	6.2	251	45.2	86	261	15.9	
	8	51	37	0	88	6.4	295	50.6	88	275	13.3	
	9	54	48	3	105	7.6	314	61.2	105	279	14.2	
	10	33	33	0	66	4.8	345	51.3	66	290	14.0	
	11	29	22	0	51	3.7	372	48.9	51	296	12.1	
	12	15	9	1	25	1.8	392	47.0	24	302	11.8	
	13	10	11	0	21	1.5	410	47.6	21	306	10.1	
	14	3	2	0	5	0.4	445	49.8	5	309	11.7	
	15											
	16											
	17											
Sample Total		782	589	14	1385	100.0	236	75.9	1383	255	24.6	1384
27 May - 2 June	2											
	3	0	3	0	3	0.3	90	18.2	3	194	7.8	3
	4	34	26	0	60	5.2	126	15.2	60	212	8.0	60
	5	337	274	0	611	52.9	159	23.2	611	227	10.2	611
	6	133	100	0	233	20.2	192	33.8	233	243	13.2	233
	7	33	28	0	61	5.3	230	36.1	61	255	14.7	61
	8	23	17	0	40	3.5	269	34.9	40	274	12.4	40
	9	27	34	0	61	5.3	308	44.6	61	280	13.1	61
	10	13	15	0	28	2.4	316	46.1	28	284	11.8	28
	11	16	16	0	32	2.8	341	31.2	32	296	10.7	32
	12	4	7	0	11	1.0	385	39.9	11	297	7.6	11
	13	8	4	0	12	1.0	374	37.6	12	301	12.9	12
	14	1	1	0	2	0.2	468	140.7	2	305	10.6	2
	15	0	1	0	1	0.1	448		1	305		1
	16											
	17											
Sample Total		629	526	0	1155	100.0	193	67.6	1155	240	24.7	1155
3-9 June	2											
	3											
	4	8	3	0	11	9.4	124	24.2	11	211	9.9	11
	5	41	37	0	78	66.7	154	21.8	78	224	8.8	78
	6	13	8	0	21	17.9	188	25.0	21	237	9.7	21
	7	2	1	0	3	2.6	197	73.8	3	242	19.1	3
	8	1	1	0	2	1.7	300	65.1	2	271	15.6	2
	9											
	10											
	11	1	0	0	1	0.9	330		1	285		1
	12											
	13	0	1	0	1	0.9	431		1	314		1
	14											
	15											
	16											
	17											
Sample Total		66	51	0	117	100.0	165	46.1	117	228	16.2	117

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## Appendix A.19. (p. 2 of 2)

Sample Weeks	Age	Sex (number)			Percent of Total	Weight			Length			
		Male	Female	Unknown		Total	Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	2											
	3	1	3	0	4	0.2	98	21.1	4	198	9.5	4
	4	52	32	0	84	3.2	128	19.2	84	212	8.8	84
	5	630	491	4	1125	42.3	165	25.4	1124	230	10.8	1124
	6	425	311	6	742	27.9	208	34.4	742	248	13.5	742
	7	80	70	0	150	5.6	242	43.6	150	258	15.8	150
All Weeks Combined	8	75	55	0	130	4.9	287	47.7	130	275	13.0	130
20 May - 9 June	9	81	82	3	166	6.2	311	55.6	166	280	13.8	166
	10	46	48	0	94	3.5	336	51.3	94	288	13.6	94
	11	46	38	0	84	3.2	360	45.2	84	296	11.5	84
	12	19	16	1	36	1.4	390	44.4	35	301	10.8	36
	13	18	16	0	34	1.3	398	46.6	34	305	11.3	34
	14	4	3	0	7	0.3	451	71.3	7	308	10.8	7
	15	0	1	0	1	0.0	448		1	305		1
	16											
	17											
All Samples Combined		1477	1166	14	2657	100.0	214	75.0	2655	247	25.7	2656
Sex Composition		55.9	44.1									
Unaged		44	29	0	73	2.7	251	83.2	73	263	32.1	73
Sex Composition		60.3	39.7									